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pf editorial

MAY, 1949

Vol. 13, No. 8

Timing

One of the basic principles to be learned in the study of any competitive sport is that of timing. Applied also to the mapping of a political campaign or an advertising program, it is often a decisive factor in the success or failure of the undertaking.

Important as timing is to a variety of enterprises, its application is of major importance in our present-day complex industrial organizations. It is a primary consideration to select a finish or a combination of finishes that can be processed in a minimum amount of time through the finishing department. Further, to raise the efficiency of floor space utilization to the maximum possible figure, and to hold down installation cost, it is desirable to select finishes that can be applied in equipment simply constructed and of moderate size.

The position of the finishing department in an industrial organization is made vulnerable both by the nature of the operation itself, and by the efforts of the process engineering department to mechanize and conveyorize the operation and limit department floor space. These same process engineering efforts eliminate or reduce to a low figure floor space reserved for "banking" fabricated parts prior to finishing, and finished parts prior to assembly. Thus, the finishing department supervisor finds himself "in the middle," depending entirely upon the fabrication supervisor for the quality and quantity of parts needed for the daily production schedule, and at the mercy of the final assembly supervisor whose one aim in life is to produce more assembled units than are scheduled. Process difficulties or equipment breakdowns either in the fabrication or finishing department only add to the woes of the finishing department supervisor. Under conditions of normal operation, the value of timed material flow is obvious; but when equipment failures occur, the importance of "timing" stands out clearly and calls upon the finishing supervisor for all of his ingenuity to make adjustments to keep the final assembly line going.

E. A. Blount

Polishing and Plating

Swing Spout Faucets

By FRED M. BURT

IN the plant of the Commercial Division of the General Tire & Rubber Co., Pasadena, Calif., completely finished kitchen swing spout faucets are coming off production lines at a rate which is said to make this plant a leading producer of kitchen faucets.

The production system is highly mechanized and closely controlled with progressive inspections and tests and with a large number of the operations tied together in synchronous flow. Current production is about evenly divided between two types of faucets in the Commodore line —the Model 502 ledge type (see Figs. 1 and 2) and the Model 508 wall type (see Fig. 3). The faucets are made from brass stampings and precision-machined brass fittings which are subassembled and permanently silver brazed. The parts are then sanded, buffed, polished, cleaned, and chromium plated, followed by final assembly, rigid testing for leaks, final inspection and polishing, packaging, and immediate shipment.

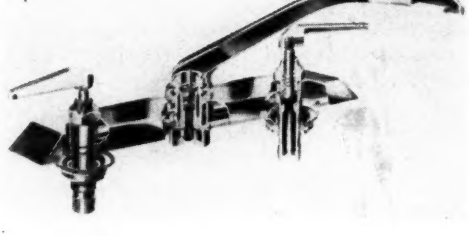

Fig. 1—Cutaway view of swing spout faucet No. 502 showing plated parts and their assembly

Prior to the first surface finishing operation, the cases and case bases are cut from 0.050-inch (16 gauge) strip brass delivered in rolls and are stamped into shape on large 350-ton hydraulic presses and on smaller punch presses. The two parts of the No. 502 spout are likewise pressed into form, to be joined by silver brazing and the No. 508 spout is formed from brass tubing.

The many brass fittings, precision-machined on screw machines by outside production contractors, are delivered on schedule and receive an immediate vapor degreasing and acceptance inspection. The handling operations to and from the four sets of brazing furnaces for the spouts, cases and certain fittings are highly mechanized. The parts to be silver brazed are assembled variously. The shapes of rings of preformed Handy and Harman Easy-Flo silver alloy (50 per cent

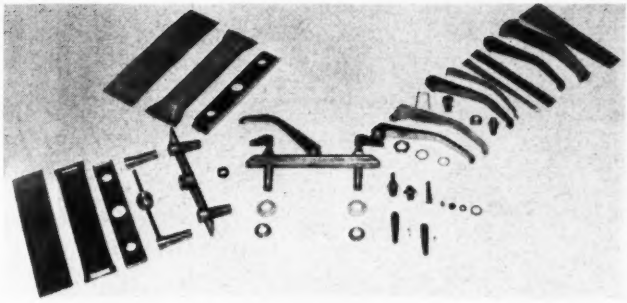

Fig. 2—Illustration of the sub-assemblies of the No. 502 wall type swing spout faucet showing the progression of their manufacturing and assembly steps, with the completed unit in the center

silver) are positioned so that the silver will flow to produce permanently tight joints during the brazing operation. As they are carried away on the chain and carrying fixture conveyors, the parts are cleaned by immersion in a mild sulfuric acid bath and in a hot water rinse so as to remove the last traces of the flux. The spouts are then given a water rinse and compressed air test for leakage.

The brazed units then move on to the sanding, buffing, and polishing lines. The underside of the large end of the 502 spout (the pivot bushing) is machined on a spot-facer, the throat of the spout is then rough sanded, and the ends are ground on a soft stone wheel. These operations are performed on a short line which is extended by the automatic polishing machine for the No. 508 cases (see Fig. 4).

This machine has eight polishing wheels and a capacity for polishing one side of 20 cases per minute. At the loading end the feeder slips a case over each block as it comes up from the return travel. The blocks are first affixed to the chain in a posiiton which allows for polishing of the case bottoms. After a set number of several thousand bottoms are polished, the blocks are changed to present the case faces to the wheels. This is accomplished by releasing a single wing nut which holds each block in place. The tops are then similarly handled. Each case is taken off the opposite end of the machine by another operator, who is protected from placing his hands in a dangerous position below working level, where the chain starts the return travel, by an electric eye beam. If this beam is broken, the chain stops automatically. An emergency stop switch is also provided at each end of the machine.

Fig. 3—Illustration of the No. 508 wall type swing spout faucet showing the progression of their manufacturing and assembly steps, with the completed unit in the upper left-hand corner

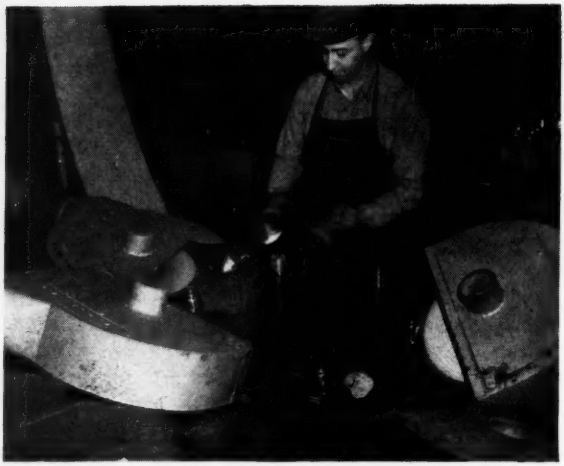

Fig. 5—Rotary polishing machine set up to continuously polish No. 508 escutcheons at approximately 10 per minute

●

ly beyond the continuous polishing machines are two automatic, rotary polishing machines —one with six rotating columns for the polishing of No. 508 escutcheons (see Fig. 5) and the other with eight columns or spindles for polishing small machined parts. All of the sanding and polishing units in this line are well hooded, with the dust particles drawn away by ducts leading to a 36-inch blower powered by a 40 h.p. motor and with a 12,000 c.f.m. capacity. A similar blower is located at the end of the ducts leading from the adjacent and parallelling double line of sanding belts and polishing wheels (see Fig. 6).

Grease polishing is performed on Behr-Manning 220 grit, 4-inch wid

Each wheel has its own push-button control so that the wheels can be stopped and changed, one at a time, without interfering with the production operation. A liquid buffing compound (Siefen Nu-Spra-Glu) is fed to all wheels automatically at the same time through overhead individual spray heads supplied from a 10-gal. pressure vessel (7 lb. air pressure). The spray heads are actuated by a cam on the conveyor chain which provides the periodic frequency of spraying required to keep the wheels sufficiently loaded with the compound.

Immediate-

●

Fig. 4 — Continuous polishing machine being used to polish the bottoms of No. 508 faucet cases. Note hose attachments for spraying compound to polishing wheels.

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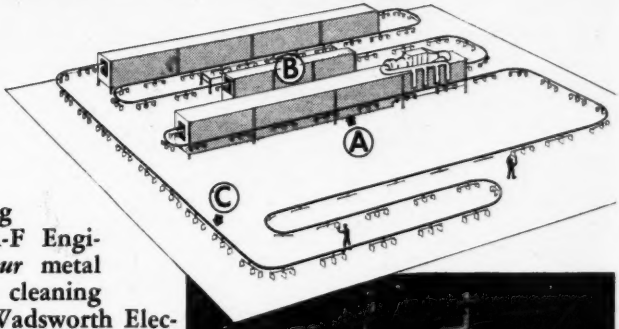

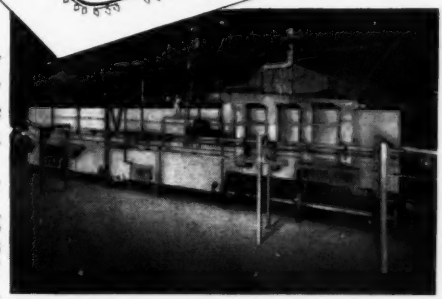

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Fig. 6—View of grease-polishing line (right) and buffing line (left). Note well-hooded wheels with ducts leading to main pipe connected to 12,000 c.f.m. blower.

118-inch long sanding belts (operating at about 10,000 f.p.m.) on polishing lathes with backstand idlers. In operation, emery cake is rubbed on the belts to lubricate them so as to prevent overheating. Five of these machines are employed, each with two belts. Two are Standard Electrical Tool Company R2V 2-spindle variable speed units, two Chas. F. L'Hommedieu lathes, and one a Hammond Rite-Speed.

In the paralleling line of six buffing lathes (five Hammond Rite-Speeds and one L'Hommedieu), each with two wheels, polishing is performed with cloth wheels and tripoli compound. On these machines, a competent operator will buff a thousand spouts in an eight-hour shift. Two men serve the polishing and buffing lines, bringing work to the operators and taking it away. An average of 30 men per shift do the polishing work plus the five inspectors who maintain an inspection line where each box or tray of parts is examined for immediate re-work or acceptance.

Containers of accepted work are immediately taken to the nearby plating department where one man loads the parts into metal trays for vapor degreasing before racking for plating. An overhead rail runs above the degreaser tank carrying a 100-lb. air hoist which lifts the loaded trays and lowers them into the tank for a one to three-minute degreasing, after which the hoist lifts them out for unloading by a worker on the other side.

At two parallel tables, nine racks ers served by one man place the parts

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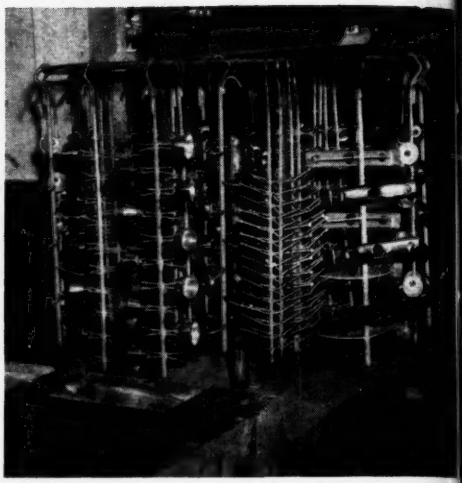

Fig. 7—Revolvable holder loaded with racks of parts to be cleaned in "soak" tank shown in foreground

to be plated on a variety of copper fixtures designed to suit the job. These fixtures are protected by Unichrome rack coating.

After the parts are flannel-cloth wiped and racked, they are hung on a revolvable wheel at the end of the first tank in the plating room (see Fig. 7). With recent production-increasing changes through the addition of new tanks and an additional plating line, the plating room has one line for the plating of brass parts that have been drawn and machined. Another line is for the No. 508 escutcheons and handles for both units, all of which are die cast from zinc base (Zemac) alloy.

On the first mentioned line, the parts are lowered into a "soak clean" tank for a 30-second immersion in Oakite No. 24 alkaline cleaner maintained at 180 deg. F. under thermostatic contro and heated by pipe coils. The parts are then passed into a rinse tank for "in-and-out" immersion. (All plain rinse tanks contain cold water, constantly changed by in-flowing water.) Following this rinse, the parts are immersed for 30 seconds in an electrocleaning tank containing an alkaline Oakite plating cleaner and operated with a 6-volt reverse current, positive on the work with the tank as the cathode. From this tank the parts are passed into a rinse tank and then into a tank containing 10 per cent cold sulfuric acid. Next the parts are transferred

Fig. 8 — Nickel plating tank equipped with Crown semi-automatic plating machine which operates on a six-minute plating cycle

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Regular anode hooks cannot be immersed in the plating solution as the hook would be eaten away and drop the anode. As a result, at least two inches of the anode must remain out of the solution. This top part of the anode is usually discarded as scrap. *Figuring nickel anode weight at one inch per pound, and costing approximately 60c per pound, you lose $1.20 in anode scrap before you start plating.** In using the new "UZALL" hook, anodes 4" shorter can be purchased since *all* the metal is immersed in the solution.

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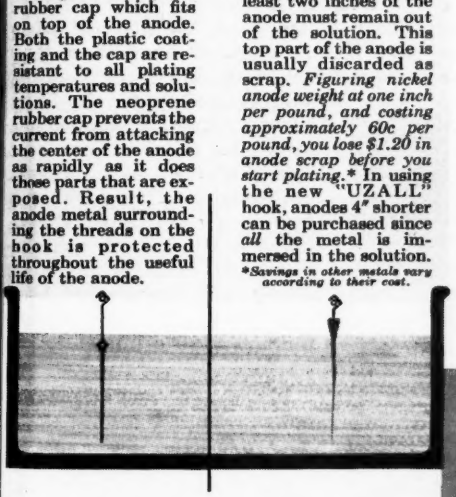

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to another rinse tank to remove the acid carry-over. In the latter three baths, the parts are in-and-out immersed.

The parts are now immersed for 10 seconds in a copper strike tank containing copper cyanide, sodium cyanide, and caustic soda. From this tank the parts are passed to another rinse tank, another sulfuric acid tank containing 1 per cent (neutralizing) bath, and then into a rinse tank, from which the loaded fixtures are transferred to the nickel plating tank (see Fig. 8). This 1,900-gal. tank has a Crown semi-automatic plating machine for handling the work in a six-minute plating travel. A Harshaw bright nickel plating solution is used at 130 deg. F. controlled heat to build up a minimum nickel coating of 0.0015 inch. The solution is analyzed twice weekly for nickel sulfate, nickel chloride, boric acid, and brightener, with additions then made to bring the solution up to standard strength. This twice-weekly analysis is a standard control practice for all the solutions in the department.

Next the plated parts are dipped in a nickel salvage tank to remove the nickel solution carry-over, which is used in replenishing the nickel solution. The parts are then transferred to a rinse tank, an acid tank containing 10 per cent cold sulfuric, another rinse tank, and then to a 600-gal. chrome plating tank to receive a 0.00001 inch minimum coating of chromium plate. The solution is made up with 40 oz. of chromic acid and 0.40 oz. of sulfuric acid per gallon of water. After in-and-out immersions in two cold water tanks and a tank containing hot water just under boiling, the racks of parts are hung above the unloading and inspection tables. Defective parts are sent to the chrome strip tank for a 30-second bath in an Oakite No. 90 solution operated at 180 deg. F., using a reverse current, and are then rinsed and ready for nickel stripping. The plating racks are also taken to this strip tank to remove the chrome deposits on the tips.

Die Cast Process

After a 30-second immersion in a "soak clean" tank the die cast parts are rinsed, electrocleaned in a tank using a Kelite alkaline cleaner at 180 deg. F. with a 6-volt direct current, rinsed, immersed in a tank containing 1 per cent cold sulfuric acid, rinsed, immersed for 10 seconds in a copper strike tank, rinsed, immersed in a tank containing 1 per cent sulfuric acid, rinsed, and transferred back to a high speed copper tank for a 6-minute immersion in

Fig. 9 — High speed copper strike tank equipped with bars on which work racks are hung, the bars being shuttled back and forth in unison by a motor-lever arrangement to provide proper agitation of the tank solution

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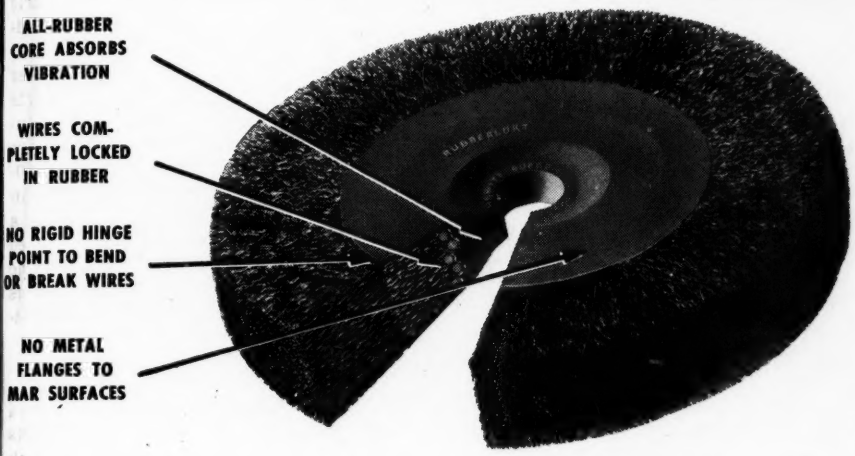
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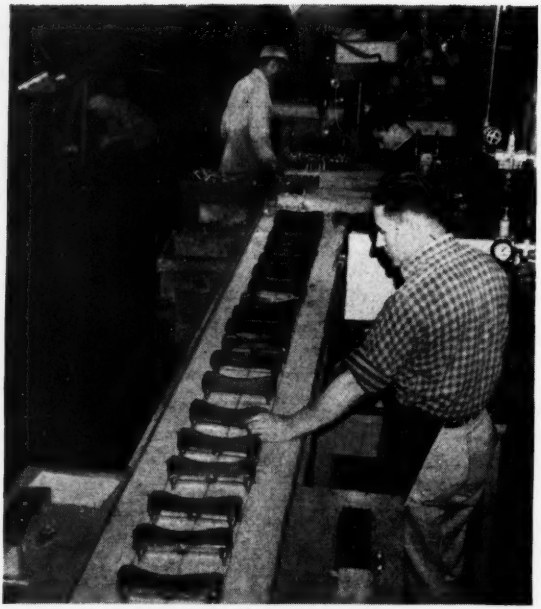

Fig. 10 — View of No. 508 cas continuous inspection line, wit assembly department in back ground

the bath, which is operated at 170 deg. F. A Du Pont potassium high speed copper plating solution is used in the latter tank (see Fig. 9).

From the copper tank the die cast parts are passed on to a tank for the salvage of copper solution carry-over which is used to replenish the copper tank, and are then rinsed, immersed in 10 per cent cold sulfuric acid, rinsed, and then conveyed to a 1,900-gal. tank for nickel plating using a Harshaw solution and a Udylite semi-automatic machine. From this tank the parts are transferred to a nickel salvage tank, rinsed, immersed in 10 per cent sulfuric acid, rinsed, and then conveyed to a chrome plating tank. After chrome plating, the parts are subjected to two cold water rinses and one hot water rinse, and are then unloaded from the racks and inspected.

The No. 502 case bases are given only a nickel plate since they are concealed underneath the cases. They are subjected to an electro-cleaning operation, followed by a rinse, 10 per cent sulfuric acid bath, rinse, and then a nickel strike using a Watts nickel solution. Following this the bases are subjected to a concentration rinse and final rinse, after which they are inspected and sent to the assembly department where they are joined by all of the other component parts.

Final assembly and inspection of the faucets is continuous (see Fig. 10). After final assembly, the units travel on a continuous line for leakage tests under high water pressure and are then packaged, placed in cartons, and shipped out immediately.

Platinum in the form of platinum-rhodium spinnerets continues to be the heart of the producing equipment in the rayon industry, where viscose solution is extruded through thousands of tiny holes of the spinneret into a corrosive acid bath to produce continuous strands of rayon. A platinum alloy device similar to the spinneret is used in the production of glass fibre, where platinum is used to withstand the high temperature of molten glass forced through small holes. Platinum's role as a hard-working metal is further illustrated in mass production of bases for electric light bulbs, where a platinum feeder die puts glass into 40,000,000 bases before the accuracy of the orifice is affected.

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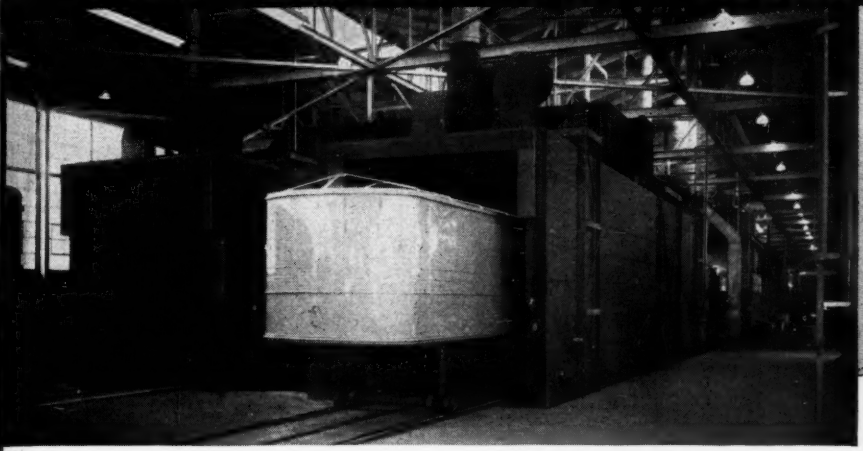

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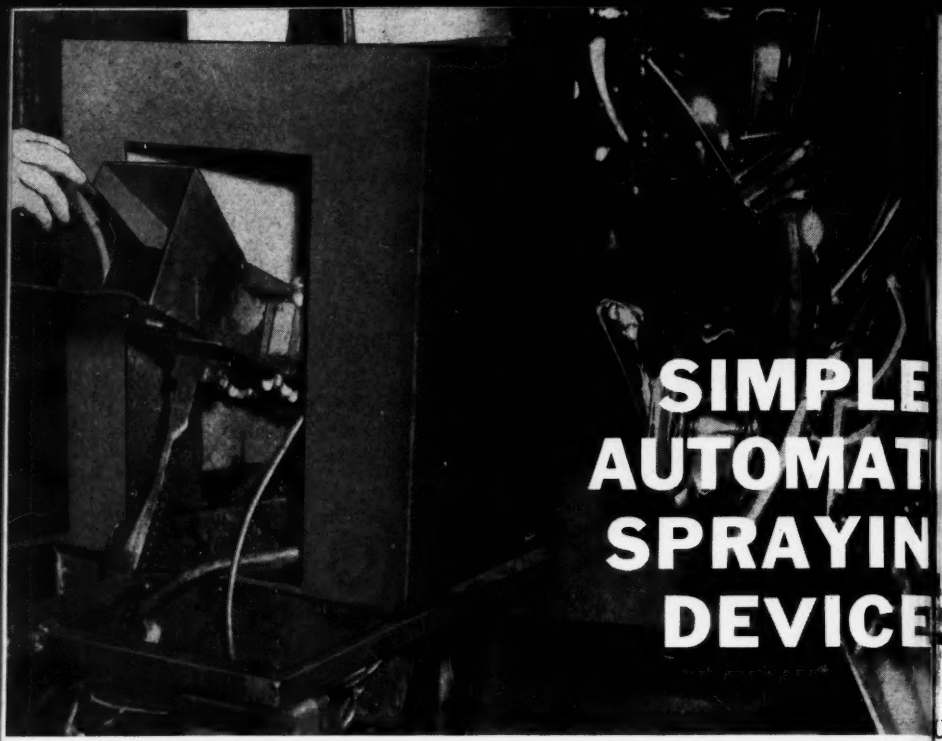

SIMPLE AUTOMAT SPRAYIN DEVICE

Bumper guards merely slide down a chute, moving gates that operate a spray gun through a micro switch and solenoid.

By HERBERT CHASE

THROUGH the application of a rather simple automatic spray setup, General Motors' Brown-Lipe-Chapin Division, Syracuse, New York, has greatly increased the rate for spraying the interior of plated bumper guards that this plant produces in large volume. The guards, Fig. 1, are stampings having a shape somewhat resembling that of a foreshortened canoe about 12 in. long. Though well plated outside, the plate does not "throw" into the recessed interior to yield a coating of adequate thickness; hence, the interior is given a supplementary coat of aluminum lacquer.

This coating must not be oversprayed so as to deposit on outside surfaces; hence, hand spraying through a mask was done for a time until an automatic setup could be devised. It takes the form of a chute diagrammed in Fig. 2. The actual setup is shown in the article heading which shows several types of parts being advanced on an overhead chain conveyor that feeds the bumper guards (as well as other products) past the spray station. This conveyor moves above a belt (onto which

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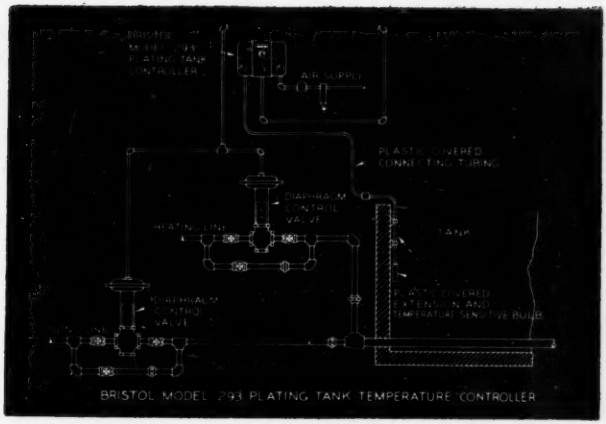

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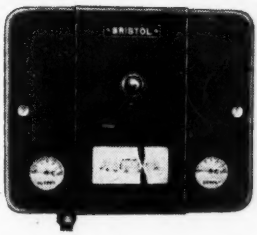

Bristol Model 293 Air-Operated Temperature Controller for plating. Controllers can be installed for steam heating and water cooling as shown above or for either steam or water.

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sprayed guards are discharged at the bottom of the spray chute) that is also shown.

With the automatic setup, all the operator does is to load the guards into the chute as rapidly as he can take them from the chain conveyor and place them, one at a time, in the

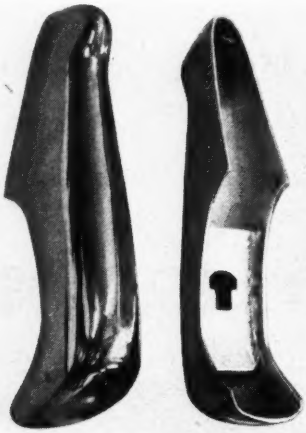

Fig. 1—Close-up of bumper guards, showing the plated exterior and the interior surface which is spray coated in the automatic setup described in the text

mouth of the chute. A small spray booth from which fumes are exhausted in the usual way surrounds that part of the chute where spraying is done. Spraying rates are 200 parts per hour faster than in the previously-used non-automatic setup.

If the gun sprayed continuously, it would not only waste lacquer but would overspray onto the ends of the guards. It is necessary to start the spray the instant the guard reaches the correct position relative to the gun and to cut off the spray just before the upper end of the piece reaches the position where overspray would occur at this end. This necessitates precise timing that is accomplished by a pair of swinging gates. These are operated by the stamping as it slides down the track, which is case hardened to resist wear.

Since the guards are loaded with the open side down, the spray gun is placed below the track and discharges upward through an opening between the two tracks. Air supply to the gun, which is a standard Paasche type, is controlled by a solenoid-operated air valve that is opened when the solenoid is energized and is closed by a spring the instant the solenoid circuit is broken, and flow of current is interrupted.

To control the solenoid circuit, there are, mounted on the outside of the chute, two micro-switches arranged so that they are operated by the gates, each of which swings about a pivot set at right angles to the plane of the tracks. These switches are connected in series with the solenoid; hence, both must be closed to energize the latter.

As a bumper guard slides down the track and contacts the first gate, the latter swings outward closing one switch. Continuing down the track, the guard swings the second gate open, closing its switch, completing the solenoid circuit and starting the spray. The latter does not start, however, until the front end of the guard has passed the gun but the spray does strike the inside of the front end and continues as long as both gates are open.

As soon as the guard clears the first gate, it swings back to closed position and opens its switch, breaking the solenoid circuit and stopping the spray. By this time however, the surfaces to be sprayed are coated and, although the second gate is still open until the guard clears this gate, this fact does not prevent stopping the spray before overspray on the rear outer end of the guard can take place.

Since the tracks are always between the spray and the edges or side portions of the guard, the tracks act as

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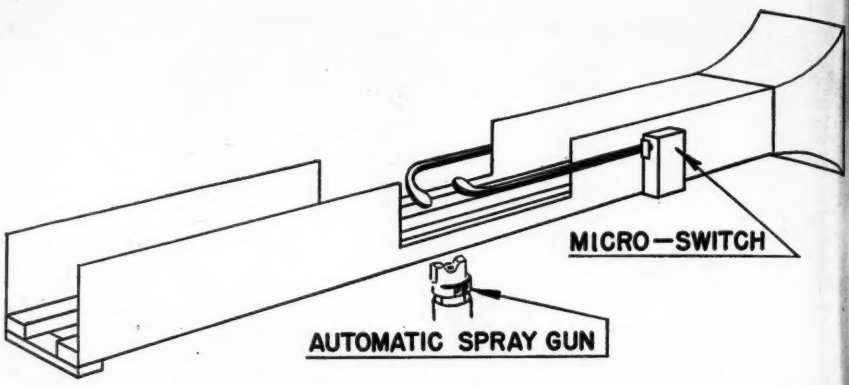

Fig. 2—Diagram of the chute down which bumper guards slide and are sprayed automatically. Gun action depends upon a solenoid valve which controls the air supply. Gates operate micro-switches in series with the solenoid.

masks and no spray can strike the outer side surfaces of the guards. The net result is that the spray is confined to surfaces it should cover and coats them adequately but does not deposit on other surfaces of the bumper guards. Since the coating is on inner surfaces only, the guards can be discharged onto the belt at the end of the chute without sprayed surfaces coming in contact with the belt. By the time parts reach the packing station at the end of the belt, the air-drying lacquer is dry enough to permit immediate loading into cartons.

New International Temperature Scale

ON January 1, 1949, the National Bureau of Standards began using the definitions of the International Temperature Scale of 1948 which were adopted by the Ninth General Conference on Weights and Measures at Paris in October 1948. The new scale definitions, which are based on a draft prepared by members of the Bureau staff, are being used by the Bureau both in its own research program and in calibrating instruments for other scientific and industrial purposes. This is the first revision of the International Temperature Scale since its adoption in 1927.

The International Temperature Scale is based upon six reproducible equilibrium temperatures, or "fixed points," to which numerical values are assigned, and upon specified interpolation formulas relating temperature to the indications of specified standard temperature-measuring instruments. The six fixed points are the boiling point of oxygen, the freezing and boiling points of water, the boiling point of sulphur, the melting point of silver, and the melting point of gold; and the temperatures for these points range from — 182.97 deg. to ± 1063 deg. C. The scale is designed to conform, as nearly as is practicable, to the thermodynamic scale which was formerly know as the Centigrade scale but which, since the Ninth General Conference, is now called the Celsius scale.

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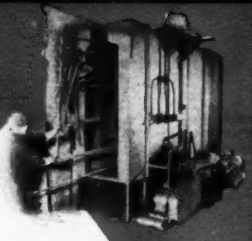

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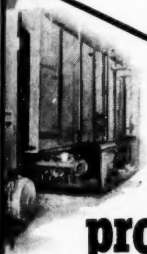
A small manual paint flow-coating unit in the plant of a farm equipment manufacturer—part of a system employing power and free conveyor and drop section cleaning position



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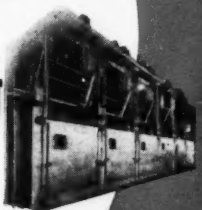

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Battery of large di rect gas fired batch type core baking ovens in large midwestern foundry—heaters located on overhead platform

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JUNE 6, 7, AND 8, 1949

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10:00 A. M.—Board of Trustees
A. B. Ritzenthaler, Presiding

12:30 P. M.—Luncheon Meeting of Kerosene Stove Manufacturers

2:00 P. M.—Electric Range Division
F. H. Guthrie, Presiding.

Export Committee
E. A. Travis, Presiding

Sleeve-Type Burner Division
Carl M. Schaffer, Presiding

4.00 P. M.—Marketing Committee
Walter F. Muhlbach, Presiding

Tuesday, June 7, 1949

10:00 A. M.—General Session
A. B. Ritzenthaler, Presiding

2:00 P. M.—SPECIALISTS' MEETINGS:

Financial Executives and Accountants
Sidney R. Hill, Presiding

Labor Relations and Factory Management Officials
J. B. Tudhope, Presiding

Sales, Advertising, and Marketing Research Executives
H. L. Clary, Presiding

Oil Division Technical Section
Kenneth Jenson, Presiding

4:00 P. M.—Oil Division Executive Committee
John W. Baillie, Presiding

7:30 P. M.—President's Reception and Banquet

Wednesday, June 8, 1949

10:00 A. M.—PRODUCT DIVISION MEETINGS:

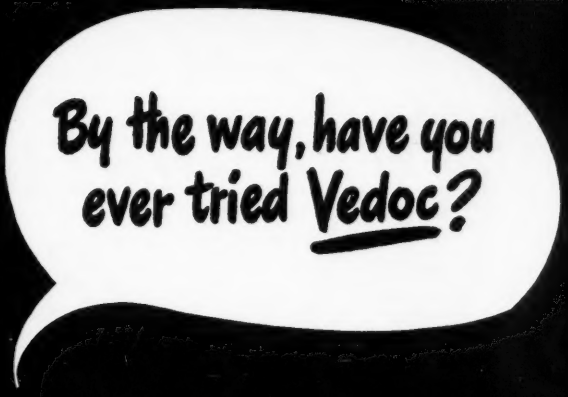
Gas and Combination Range Division
Cecil M. Dunn, Presiding

Gas Space Heater and Floor Furnace Division
F. D. Hart, Presiding

Oil Division
John W. Baillie, Presiding

Solid Fuels Division
W. H. Martin, Jr., Presiding

Credit Managers Division
Earl D. Weiland, Presiding



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Finishing Clinic

In this department are presented some of the questions submitted by readers together with suggested solutions of the problems outlined.

Question. *Can you furnish us with some methods of producing decorative and antique finishes on lead? K.H.R.*

Answer. In the book "Metal Coloring and Finishing" by Hugo Krause, published by Chemical Publishing Co., 26 Court St., Brooklyn 2, N. Y., a black coloring of lead is mentioned as being formed with a solution of ammonium polysulfide. Arsenic stain or platinum chloride may also be used. Lead oxide coatings formed by making lead objects the anodes in a lead solution are mentioned. Molybdate coloring processes consisting of a dip in a solution of 20 grams per liter of ammonium molybdate or in salts of oxalic acid, aluminum chloride, and ammonium sulfate are also used.

The author does not specifically mention the possibility, but it may be possible to plate other metals over lead by first treating the lead surface in the familiar concentrated nickel chloride solution which is used to deposit nickel on normally passive surfaces, or by using a preliminary dip such as the sodium zincate dip which precedes the plating of aluminum. It is not difficult, of course, to plate indium over lead directly. This process was used during the war to improve aircraft engine bearings.

———fc———

Question.—*Can you advise us whether there are any correspondence school courses in the fields of plating and finishing? M.F.*

Answer. As reported in the November issue of PRODUCTS FINISHING, a correspondence course in electroplating is being offered by Joseph B. Kushner, Stroudsburg, Pennsylvania.

———fc———

Question. *We are interested in securing a possible outlet for scraps of maple boards left over from our manufacturing operations together with sawdust of the same material. W.R.H.*

Answer. The application of wooden blocks (particularly maple) and hardwood sawdust to the electroplating and finishing industry is rather widespread. Wooden blocks such as you saw illustrated in PRODUCTS FINISHING are used for various barrel finishing operations, both as buffers as described in Mr. Beaver's article and as grease absorbents in the barrel finishing of zinc base die castings. Sawdust finds application in many plating shops for the drying of small parts.

———fc———

Question. *Can you furnish us with information regarding methods of measurement of the thickness of hard chromium plate?*

H. E. C.

Answer. A magnetic thickness tester such as the Magne-Gage is generally considered to be a rapid, reliable method for determining thickness. However, you might have difficulty in measuring the thickness of metal in certain inaccessible areas. In view of this possible difficulty, you might be able to employ successfully an electromagnetic thickness tester such as that manufactured by the General Electric Company.

There are chemical test methods whereby the coating is removed and the time required is used as a basis for calculation of the thickness of the metal, but there is some doubt as to the accuracy of such methods when applied to heavy chromium coatings. However, we can present information concerning two tests of this type:

Spot Test

The thickness of thin chromium coatings can be determined by placing concentrated hydrochloric acid of specific gravity 1.18 on the coating and measuring the time in seconds required for the chromium to dissolve. The interval between the beginning and cessation of a gas evolution is measured with a stop watch. The rate of solution of chromium is affected by the temperature. The thickness of coating in millionths of an inch may be obtained by multiplying the time in seconds by the thickness factor given in the accompanying table which was prepared by Olson and Blum of the National Bureau of Standards:

Temperature— Deg. C.	Factor— Millionth In./Sec.
17.8	0.75
20.0	0.80
22.2	0.87
24.5	0.95
26.7	1.08
28.9	1.27
30.0	1.39

Electrolytic Test

The electrolytic test involves the anodic solution of chromium at a constant current density so that the time required may be taken as a measure of the thickness of coating. A glass cylinder is placed on the test surface and made water-tight with a rubber washer or wax coating, and is filled with a solution containing 50 grams per liter of trisodium phosphate and 70 grams per liter of sodium sulfate. The plated surface is made the anode and a piece of wire gauze is inserted at the top of the cell for the cathode. At a current density held constant at any value from 30 to 100 milliamps per square centimeter, the time required to dissolve the chromium may be checked with a stop watch. The end point may be detected by noting when gas evolution begins from the plated surface and also when the voltage rises. The apparatus is calibrated with chromium coatings of known thickness and results obtained are compared to those obtained with the standard coatings.

A. G. G.

Some Thoughts On DRYING

By ROLLIN H. WAMPLER

ALL organic finishing materials must dry. Applied in liquid form, the drying process converts them to hard, solid films. In finishing industrial products, drying must occur as rapidly as possible. Since the conditions that obtain during drying influence not only the rate of drying, but as well many of the qualities of the film, it is important that the drying process be understood by users of industrial finishes.

The non-volatile portion of an enamel or other material is the portion that is left when the solvents are all gone. If this portion is in itself a hard, rigid, tough material, then the film has reached its final stage of drying when the solvents have evaporated. In such a case the material is said to dry solely by solvent removal or evaporation. Lacquers, shellac, spirit varnishes, and some other materials dry by solvent removal alone. That is the reason why they dry so rapidly.

When the non-volatile portion is a heavy liquid (sticky and plastic) after the solvents have evaporated, then other processes must take place to convert the liquid base to a hard, rigid film. These processes may loosely be called oxidation and polymerization. If the molecules contain conjugated double bonds and are capable of absorbing oxygen, an internal chemical change occurs which converts the viscous liquid to a hard film. This chemical change may produce cross-linkages between molecules which causes the mass to set to a non-tacky, rigid film. Driers are metallic catalysts which promote the absorption of oxygen. Too much drier may cause the process to go too far, producing a brittle instead of a tough film. Oleoresinous varnishes and drying type alkyds are examples of materials that absorb oxygen in drying.

Some materials having a liquid non-volatile base dry by solvent evaporation and polymerization, with little or no oxygen absorption. Examples are melamine and urea-alkyd (non-drying) combinations which must be baked in order for them to form hard, rigid films. Polymerization is a process whereby molecules are bound together with cross-linkages to form solid masses. It will be seen that oxidation is really a form of polymerization, but we consider it separately because it occurs under somewhat different conditions than the type of polymerization in which no oxygen is required for the reaction.

Solvent evaporation is always the first stage in drying. It is also the last stage where the non-volatile portion is

hard and firm. When the base is a liquid, then oxidation and/or polymerization follow the solvent evaporation phase and convert the liquid base to a hard film.

What are the factors that influence these processes? Broadly speaking, there are three: heat, air composition, and air movement. Of these, heat is the one most often varied in order to speed up the drying process. Increasing the temperature of the air and of the drying film causes the solvents to leave faster by increasing their vapor pressure, or their tendency to evaporate. In large conveyor installations the drying of lacquer is sometimes accelerated by passing the coated objects through an oven where the temperature of the air may be in the range 100 to 200 deg. F. Heat also increases the rate of oxygen absorption, so that less drier is needed for baking materials than if the same materials are air-dried. All polymerization processes are accelerated by heat, although the rate is sometimes varied by means of catalysts.

In general, air-drying materials are designed to dry at temperatures under 100 deg. F. Air-drying materials and some heat-converting ones will dry in the range of 100 to 200 deg. F., which is called the force-drying range. Any material designed for drying above 200 deg. F. may be considered to be a baking material.

The air composition has an important influence on drying. If the air is laden with solvent vapors, the solvents in the drying film will come out slowly. Rapid removal of solvent vapors is necessary for fast drying. Similarly, high humidity slows down solvent evaporation. In fact, moisture is sometimes introduced into the air in ovens where finishes are baked on metal in order to slow down the evaporation of solvents to prevent pitting and blistering.In direct-fired gas ovens the combustion vapors will retard drying unless they are removed; and may also cause dulling, loss of gloss, and other troubles. Where oxidation occurs, there must be continual removal of oxygen-deficient air so that the film will have a constant supply of oxygen.

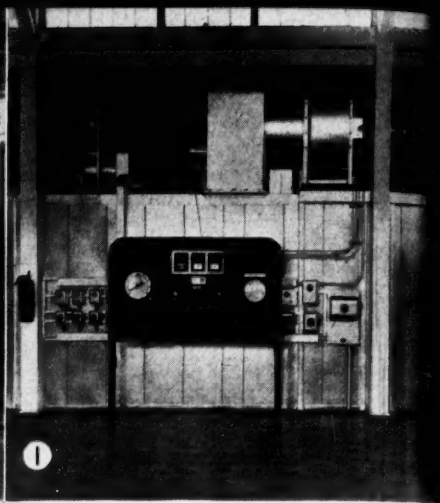
The third factor that influences drying is air movement. Reasonably rapid

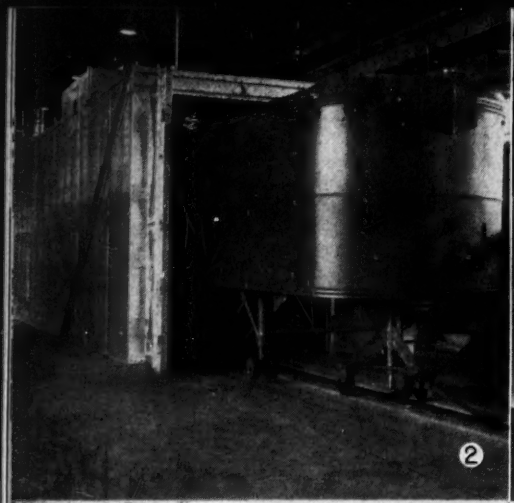
Rollin H. Wampler

ROLLIN H. WAMPLER is organizer and president of the Wampler Chemical Co., Harrisonburg, Va., manufacturer of wood finishing materials. In addition, he acts as finishing consultant to paint manufacturers and industrial consumers of organic finishes.

Mr. Wampler's industrial background includes service with the Southern Varnish Corporation as chemist and technical director from 1931 to 1945 and with the Wood Finishes Division, Jones-Dabney Company, a division of Devoe & Raynolds Company, as assistant manager from 1945 to 1947.

He is the author of the book "Modern Organic Finishes, Their Application to Industrial Products," published in 1946 by the Chemical Publishing Co., New York, N. Y., and has been a contributor to numerous magazines, supplying articles on finishing over the past 10 years.





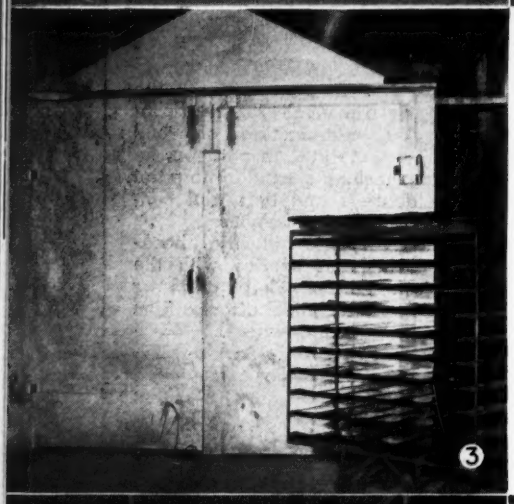


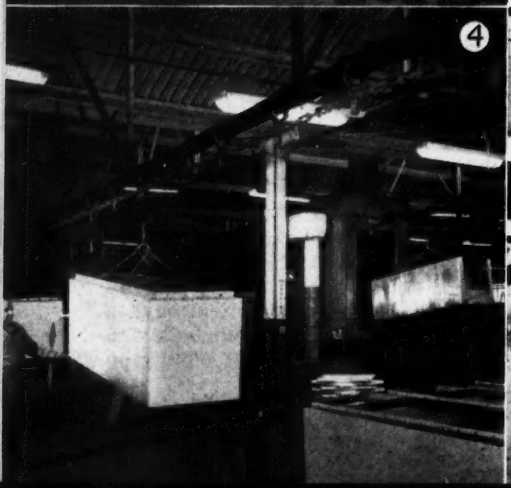
Fig. 1—A direct-fired gas recirculating type K comb-Detroit oven. The heating equipment, air fan, and air seal mechanisms are located top of the oven, and the control panel with star equipment and oven temperature controls may seen in the foreground. (*Photo courtesy Newco Detroit Co., Detroit* 11, *Mich.*)

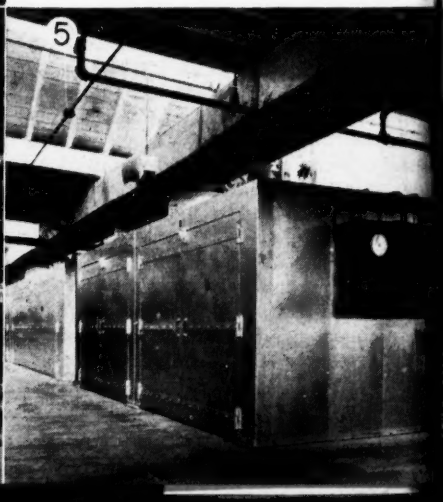
Fig. 2 — Illustration shows a semi-trailer b emerging from the exit end of a Young Broth direct-fired kiln-type oven installed in the pl of the Highway Trailer Company. (*Photo coun Young Brothers Co., Detroit* 7, *Mich.*)

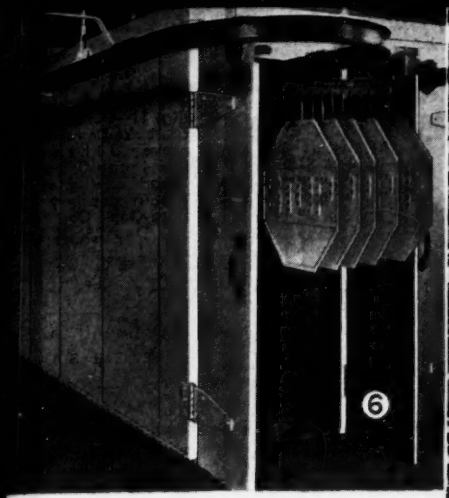
Fig. 3—A Ferro-engineered gas-fired batch-t baking oven installed in the plant of the Kala zoo Stove Company. (*Photo courtesy Ferro Enc Corp., Cleveland* 5, *Ohio*)

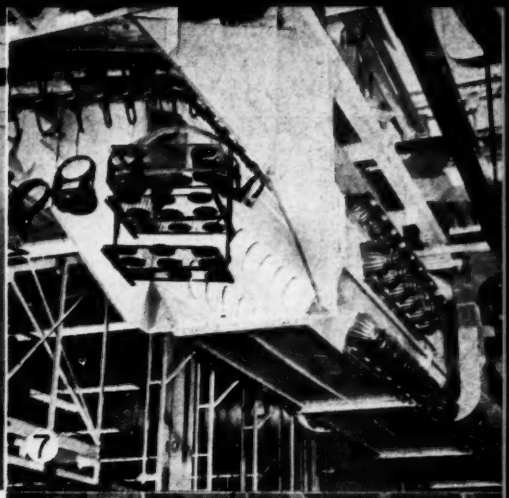
Fig. 4—Frigid-Freeze cabinets leaving Despa built finish coat oven at Noma Electric c baking 30 minutes at 280 deg. F. (*Photo coun Despatch Oven Co., Minneapolis, Minn.*)

Fig. 5—A Mahon batch-type oven installatio the Stout Sign Company plant. Automatic rec ing temperature control equipment may be s in the foreground. (*Photo courtesy R. C. Ma Co., Detroit* 11, *Mich.*)









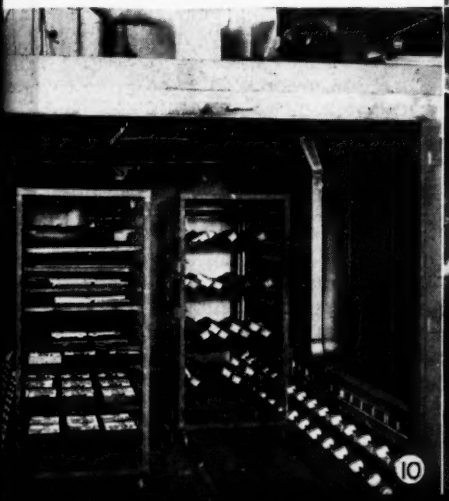
g. 6—Products are finished in this conveyorized
k & Blum controlled temperature oven installed
the plant of the National Colortype Company
baking at 450 deg. F. (*Photo courtesy The Kirk & Blum Mfg. Co., Cincinnati 25, Ohio*)

g. 7—Illustration shows a Gifford-Wood infra-
d heating installation at the Sperry Gyroscope
mpany plant. The installation consists of two
ens each approximately 23 feet long and rated
60 kw. capacity. (*Photo courtesy Gifford-Wood Co., Hudson, N. Y.*)

g. 8—Air filters are baked in a Jensen overhead
ra-red oven at the plant of the Industrial Wire
oth Company. (*Photo courtesy Jensen Specialties, Inc., Detroit 27, Mich.*)

g. 9—Illustration shows a typical Koch convey-
zed gas-fired oven. (*Photo courtesy George Koch Sons Co., Evansville 4, Ind.*)

g. 10—Finishes are baked on products at the
ster Finishers plant in 10 to 15 minutes at 300
g. F. in an oven equipped with Burdett infra-
gas burners. (*Photo courtesy Burdett Manufacturing Co., Chicago 24, Ill.*)



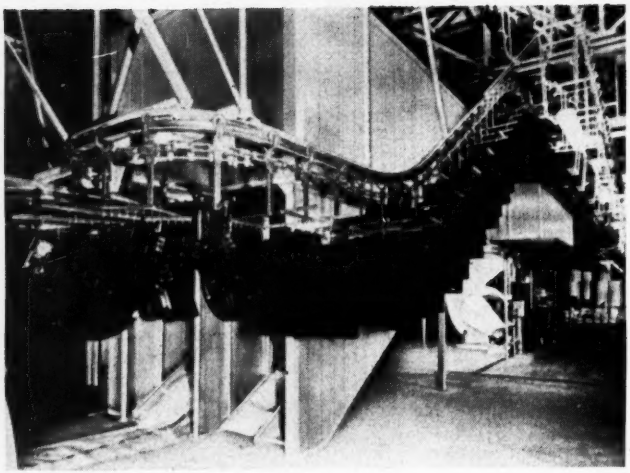


Fig. 11—Painted parts are baked as they are conveyed through this Spray-Con overhead baking oven. (*Photo courtesy The Spra-Con Co., Chicago 22, Ill.*)

air movement (and partial replacement) is necessary to remove solvent vapors and foul gases so that fresh, warm air is always available to the drying film. In addition, since solvent evaporation causes cooling, the air must move fast enough to bring the needed heat to the drying film. Of course, air movement may also be too rapid and cause trouble.

Now that we have considered in an elementary way the mechanism of drying and the factors that influence it, we can consider some drying troubles and point the way to their solution.

Poor surface drying or tackiness can be caused by lack of sufficient heat, by foul air, or by insufficient air movement. No air-drying material should be expected to dry at temperatures much below 70 deg. F. If the products are finished with air-drying materials, and the temperature drops to 50 deg. F. during the night, for example, then the film may not be dry the next morning. If tackiness occurs in baking materials when they have cooled to room temperature, check actual oven temperatures and air movement in the oven. On short schedules a drop of only a few degrees can cause trouble. Sometimes stickiness may occur in enamels that have been stored for a long time before being used. This may be caused by drier absorption by the pigment. If an old material must be used, be sure to check it before putting it into production. If it is tacky, it is well to call in the supplier to adjust the material before using it in production. But by far the best policy is to prevent old stock from accumulating. Careful stock control should ensure that only fresh materials are on hand at all times.

Poor through drying, or tenderness in the film when it should be hard may be caused by the same conditions that cause tackiness, or poor surface drying. In addition, poor through drying may be caused by films that are too thick. Check wet film thickness regularly in production in order to obviate this difficulty.

Orange peel or poor flow may be caused by too rapid air movement. Freshly sprayed or dipped stock that passes by an open window may encounter a draft which causes the solvents to leave so fast that the film solidifies before it has time to flow out. The flow-out portion of the drying cycle should be completed in a location free from drafts.

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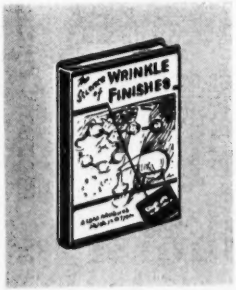

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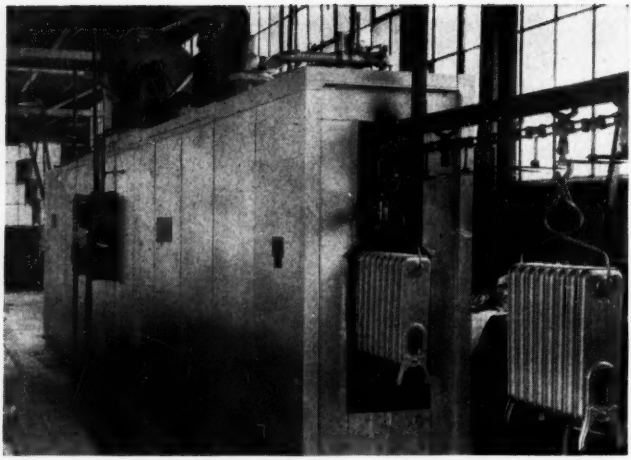

Fig. 12—In the pla of the Metal Specialt Co., Richmond, Ind. a gray "hammered finish is baked o radiators in thi straight-through tu nel single-pas Young & Bertke ove at a temperature o 325 deg. F. The ove is equipped with Bu dett infra-red ga burners, air seals and a recirculatin system to ensure sa isfactory operation. (*Photo courtesy Th Young & Bertke Co Cincinnati 14, Ohio*)

Blistering and pitting may be caused by solvents forming bubbles within the film. Too rapid air movement, and too much heat (such as a "hot spot" in the oven) or too much heat early in the drying process all may cause the solvents to form bubbles in the film instead of diffusing through the film and leaving without distorting it. Gases from rust-inhibiting treatments on metals and trapped air or moisture in wood also may cause pitting and blistering. In any event, make sure the film is not too thick, make sur there are no hot spots in the oven, an make sure that in convection ovens n blast of heated air strikes the finished surface directly.

Poor gloss may be caused by foul stale air in the oven or by overbaking Poor gloss in enamels may also resul from vehicle absorption by a too-por

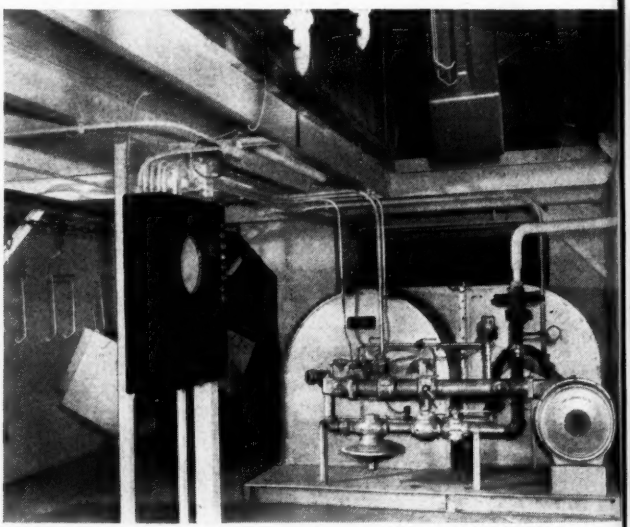

Fig. 13 — Illustration shows gas heating equipment and automatic recording temperature controller for a Peters-Dalton baking oven installed in the plant of a large metal furniture manufacturer. (*Photo courtesy Peters-Dalton, Inc., Detroit 12, Mich.*)

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ous undercoat.

Color changes in enamels may be caused by lack of uniformity of the heat in the drying oven. This is especially likely to occur with white baking enamels. Often a few degrees difference in temperature may cause enough color change that different parts of the product may not match.

Runs and sags may occur, even if the film is of the proper thickness, if solvent-laden or muggy air keeps the film liquid long enough for its weight to cause sagging. Air movement must be neither too fast nor too slow.

There are many difficulties in finishing that can be traced to improper drying conditions. Regardless of the nature of the trouble, it is well to study drying conditions first of all.

An improved paint for preventing ice formation and accumulation on various surfaces, including aircraft propellers, is described by W. A. Palmer in U. S. Pate 2,431,885. Depending on the presence free glycerine, this coating composition prepared by mixing glycerine an phthalic anhydride in equal molecula proportions. These are heated together under specified conditions until a limited gelling occurs. Then an addtional amount of glycerine, preferably about equal to the original amount, is incorporated and heating is continued until the desired end-point is reached. At this stage heating is discontinued but not the stirring. When sufficiently cool, alcohol or other volatile thinner is added to form a uniform dispersion. Usually the amount of thinner required is about 40 to 50 per cent by weight of the compound. In any case enough thinner must be used to permit easy spraying or brushing on the surface to be protected from icing. If applied to the surface in a heated condition, very little, if any, thinner is needed. Under service conditions, the free glycerine is retained in this coating for a long time.

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Spotlight

FINISHING Progress

Trends in Alkyd Resins

VARIOUS forms of protective and decorative coatings based on alkyd resins have been employed industrially for over 15 years. One of the first major uses for alkyd resins in surface coatings was to modify the characteristics of cellulose nitrate lacquer, which resulted in outstanding improvement in appearance and weather resistance. Starting in the early thirties, alkyd resins came into widespread industrial acceptance in such applications as automobile and refrigerator finishes and for industrial and agricultural equipment such as tractors. The widespread acceptance of alkyd resins as vehicles for enamels by the United States Navy department during World War II, based on the excellent performance shown by these resin coatings under severe service conditions, has suggested their use in many new applications.

In discussing the recent advances and trends in alkyd resins before the 1948 Annual Conference of the Chemical Institute of Canada, T. H. Glynn Michael, Woburn Chemicals, Ltd., Toronto, brought out the fact that most applications where good initial gloss, gloss retention, flexibility, water resistance and exterior durability are important can be filled by suitable alkyds. (See also "Canadian Chemistry & Process Industries"—October 1948.) The alkyd may be used either alone or in combina-

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tion with another type of vehicle. In general, the alkyd family of vehicles is suitable for almost any application where alkali resistance of the film is not of paramount importance, and as pointed out by Michael, even this drawback is being remedied somewhat. It should be remembered that the alkyds are fundamentally esters, and as such, are subject to saponification. Exterior architectural enamels, flat wall emulsion paints, and refrigerator enamels are some of the diverse types of finishes commonly based on alkyd resins.

Alkyd resins are used in the finishing industry in several ways, the largest proportion being employed as the sole vehicle for both air drying and baking applications. They are also utilized in lacquers with cellulose derivatives for fast air-drying finishes. In addition, the alkyd family of resins fortify oil paints and varnishes and are also used in conjunction with such resins as urea-formaldehyde, melamine formaldehyde, modified phenolic and others. The distinctive position that the alkyd resins occupy in the coating field is based on a number of reasons. Severe tests have proved that alkyd enamels exhibit good resistance to moisture, and solvents such as gasoline; many alkyd finishes are outstanding in retention of gloss and color after exterior exposure and have almost unexcelled durability.

Composition of Alkyds

As a basis for his discussion Michael pointed out that a "pure" alkyd resin is generally regarded as the condensation product of one or more polybasic acids with one or more polyfunctional alcohols to which has been added a fatty acid or acids. These fatty acids may be introduced as such, or in the form of a naturally occurring or synthetic glyceride. By a "modified" alkyd is meant one to which some other

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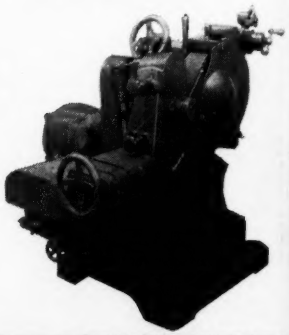

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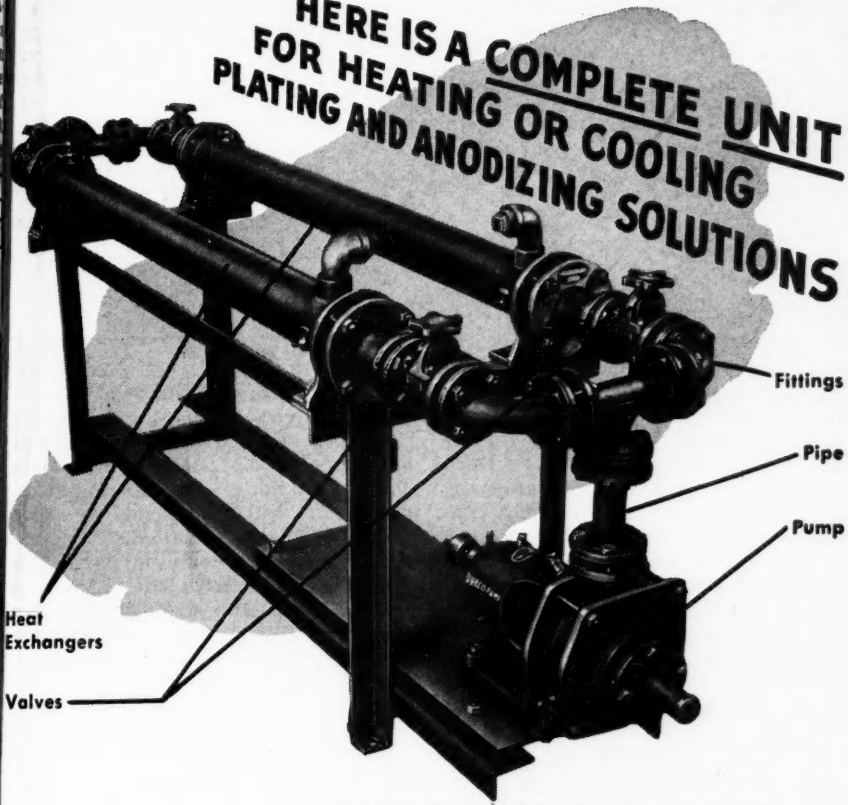

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TABLE I

Compounds Used in Alkyd Formulation

Acidic Compounds	*Alcoholic Compounds*	*Modifying Compounds*
Maleic anhydride	Ethylene glycol	Linseed oil
Fumaric acid	Glycerol	Soy oil
Phthalic anhydride	Pentaerythritol	Dehydrated castor oil
Itaconic acid	Sorbitol	Chinawood oil
		Oiticica oil
		Fatty acids of the above oils
		Rosin
		Phenolic resins

resin or gum has been added. Thus, it can be seen that alkyd resins are esters of acids and alcohol.

The compounds listed in Table I are those commonly used in alkyd resin manufacture; however, probably the most widely used are phthalic anhydride, glycerine, linseed oil and soy oil. One fact of interest brought out by Michael was that the use of pentaerythritol was first undertaken as a wartime substitute for the then scarce glycerine, but it soon became recognized that the pentaerythritol alkyds possessed unique and desirable properties. According to Michael, these include such properties as superior water resistance and increased hardness for a given oil length, together with the flexibility associated with that oil length, as well as excellent thorough dry, with rapid initial dry.

It was pointed out that the use of pentaerythritol is not simply its substitution in an established glycerol formulation. Instead, each pentaerythritol formulation presents it own problems and possibilities. In general, it was indicated that soy and dehydrated castor oils appear to be the most satisfactory for the modification of pentaerythritol phthalate. These combinations provide all the advantages of pentaerythritol alkyds, together with the pale color and color retention associated with the oils.

In the way of future predictions Michael stated that the use of tetra and hexa-hydric alcohols will probably gradually increase. However, it does not appear that any fundamental changes in the oil constituents of alkyd resins will take place. As purer fatty acids become available it is probable that they will be used, particularly in the non-glycerol types of alkyds. So far as meeting competition from the vinyl resins, it was stated that this would probably be met by the formulation of alkyds containing certain amounts of compounds having polymerizable vinyl groups.

An increased use for alkyds in blending with other resins was forecast by Michael. Most coating technicians are familiar with the use of alkyd resins in admixture and melamine and urea-formaldehyde resins. These blends have properties which particularly suit them for use in white baking enamels. This type of use will probably increase with the development of alkyds having outstanding performance in such blends, provided the development is not limited by economic factors.

Results of Resin Coating Tests

Michael reported experimental details on the examination of color retentive long chain alkyds based on recent laboratory work. Alkyds of 60 per cent fatty acid content were prepared using soy and dehydrated castor

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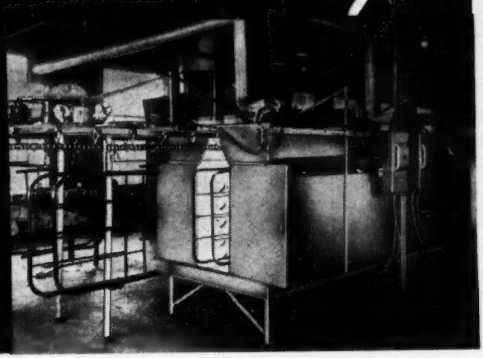

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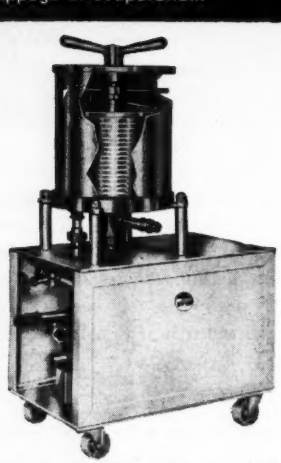

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oils. These were prepared using both the oil and the fatty acids of the respective oils. In most cases, it was stated, that two series of the alkyds were prepared, using glycerol and pentaerythritol as the alcoholic constituents. To carry out the tests simple enamels were prepared from each resin using the conditions shown below:

Grind ——— 48 hours pebble mill
Pigment ——— Titanox No. A-168 L.O.
Pigment/Binder ratio ——— 1:1.5
Driers—Lead, 0.5% (on vehicle solids)
Cobalt, 0.5% (on vehicle solids)
Baking schedule—1 hour at 250 deg. F.
Panels ——— 18 gauge cold rolled steel, degreased
Application ——— by applicator blade to give wet film thickness of 0.003 inches.

Panels were prepared both from the clear alkyd solutions and from the pigmented enamels and submitted to various tests. In summarizing the results of these tests Michael stated that a number of interesting conclusions could be drawn. It was found that the hardness of the clear films showed a regular progression from oil-glycerol through oil pentaerythritol to fatty acid pentaerythritol. Both the soy and dehydrated castor oil series showed very similar behavior. The enamel panels possessing the highest hardness and gloss were prepared from the fatty acid-pentaerythritol alkyds. Also, it was found that the dehydrated castor oil fatty acid gave harder films and slightly higher gloss than the corresponding soy-based enamel.

The experiments showed that the best gloss retention on baking was provided by the soy-oil-glycerol alkyds. The gloss for these was essentially the same for air dried and baked panels. It was brought out that both the oil and fatty acid resins prepared with pentaerythritol and the dehydrated castor-oil-oil-glycerol type showed considerably reduced gloss on baking. However, it was shown that

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the highest actual loss on the baked enamels was shown by the soy-fatty acid-pentaerythritol resin.

Concerning resistance and durability of the coatings, Michael reported that the experiments showed the best alkali resistance to be obtained from the dehydrated castor oil-fatty acid-pentaerythritol system, and this resin was second to the dehydrated castor oil-pentaerythritol resin in water resistance. The poorest rating was made by the oil-glycerol systems. With reference to drying times the pentaerythritol alkyds showed faster drying times than the glycerol alkyds. Fastest surface time was shown by the oil pentaerythritol combination, both dehydrated castor oil and soy being very similar. In general, the pentaerythritol-fatty acid systems made a good showing on all counts. One point of interest to finishing specialists interested in high gloss coatings, brought out by Michael, was that retention of gloss on baking has been found to be very much more satisfactory using slightly lower oil content.

Expanded production facilities for the manufacture of alkyd resin raw materials, as well as the resins themselves, and the many new technical developments affecting their manufacture will undoubtedly enable the manufacturers to make the alkyd family of resins increasingly attractive to the finishing industry. According to the interpretation of Michael, it is becoming increasingly clear that alkyd resin production should be undertaken only by coating vehicle manufacturers, who can produce in sufficient volume to install the complex and expensive process equipment required for production of resins with controlled properties. In this way, according to the advice given finishing engineers by Michael's viewpoint of future trends, the entire trade as well as the ultimate consumers of coatings will benefit

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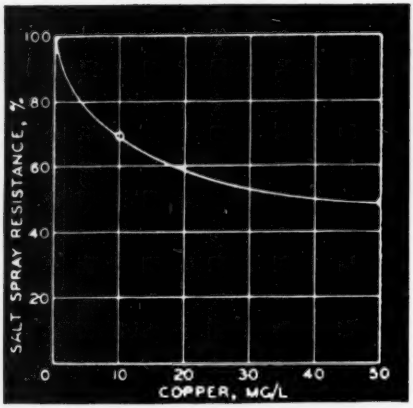

Fig. 1—Curve showing per cent salt spray resistance of 0.001-inch nickel coating on steel as a function of the copper impurity concentration in the bath (Watts)
(Illustration courtesy American Electroplaters' Society)

through the production and availability of high quality, uniform, and lower-cost alkyd resins.

* * *

Effect of Copper in Nickel Plating Solutions on Corrosion Resistance of the Plate

CONSIDERABLE data has recently been compiled under American Electroplaters' Society Research Project No. 5 showing that copper as an impurity in nickel plating solutions reduces the salt spray corrosion resistance of nickel plated steel articles. Experimental work under the project was carried out at Michigan State College under the direction of D. T. Ewing, with associates Robert Rominski and William King, and also showed that the effect of the commercial practice of chromium plating over the nickel deposit is to prolong the life in the salt spray; however, the same overall detrimental effect of the copper as an impurity in the nickel was evidenced. A typical curve is shown in Fig. 1 for plate produced from the Watts type nickel bath where it is brought out that in a bath of this type containing 10 mg./l. of copper the salt spray resistance is decreased about 25 per cent, while a five-fold amount of copper about doubles the loss.

The results of tests conducted on the nickel-chromium plates also show the effect of copper as an impurity in the nickel. The chromium plate increased the number of hours in the salt spray but did not conceal entirely the effects of the copper. To illustrate the experimental results, the project researchers constructed the bar graphs shown in Fig. 2 from composite data collected using four types of nickel plating baths. In all cases but one, copper had a detrimental effect on the salt spray resistance of the deposit; it was pointed out that this one exception occurred with the heavier deposits of nickel

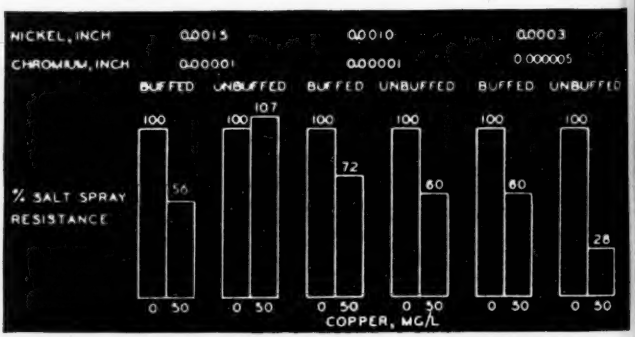

Fig. 2—Effect of copper impurity concentration in nickel bath on salt spray resistance of nickel-chromium coatings on steel showing effect of thickness and buffing of the nickel deposit
(Illustration courtesy American Electroplaters' Society)

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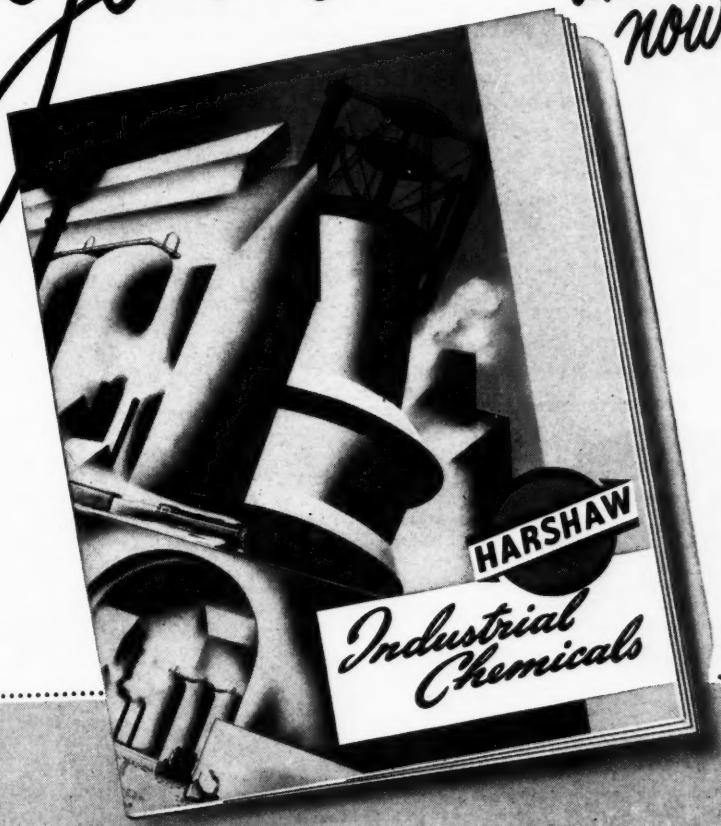

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of which reproducible data have been difficult to obtain. The data shown was taken from one series only.

A comparison of the bar graphs in Fig. 2 shows that with 0.001 inch unbuffed nickel, the relative effect of copper is about the same, independent of whether chromium is present or not. It was pointed out in the report on the research project that to check the results with nickel plate, new panels were prepared with copper as an impurity and tested in the identical manner as the nickel-chromium series, wherein it was found that the percentage reduction caused by copper was very nearly the same for the two series. All plated panels studied were tested for corrosion resistance in a commercial salt spray (fog) cabinet. The breakdown was reported after a condition had been reached comparable to that of a set of previously prepared breakdown standards. In all cases the salt spray resistance was reported as a percentage of the resistance of equivalent deposits from pure solutions.

In conducting the experimental work cathode panels of low carbon cold rolled, high finish steel, size 2 x 3½ inches, were used. Prior to plating they were cleaned in an alkaline silicate-phosphate cleaner, followed by pickling in 20 per cent by volume hydrochloric acid. Plating was carried out at 40 amp./sq. ft. in one-liter glass battery jars. The thicknesses of nickel deposits prepared were 0.0003, 0.001 and 0.0015 inch, each with six concentrations of copper in the nickel bath; namely, 0, 10, 25, 50, 75 and 100 mg./l. In the experimental technique employed, the rate of depletion of copper at 40 amp./sq. ft. had been determined previously, and additions were made at the necessary intervals to maintain the concentrations of copper at constant values.

Panels to be chromium plated were

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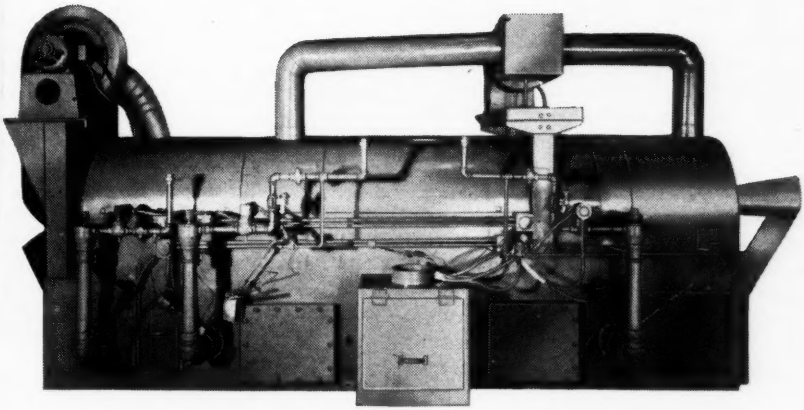

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prepared in much the same manner. It was pointed out, however, that the highest concentration of the copper impurity, that is, 100 mg./l., was omitted in view of the fact that the appearance of the panels would prohibit their commercial use. In the buffing operation on the nickel, prior to chromum, a jig was used so as to buff only one half of the panels under identical conditions. The thickness of the chromium plate was 0.00001 inch for the 0.001 and 0.0015 inch nickel panels and 0.000005 inch for the 0.0003 inch nickel panels.

Platers concerned with the control of copper impurity in nickel plating solutions will be interested in work conducted under American Electroplaters' Society Research Project Number 2 which is concerned with the determination of impurities in plating baths. Work on this project conducted at Lehigh University by E. J. Serfass, Project Director, and W. S. Levine, Associate, has developed a method for analysis of nickel plating baths for traces of copper, which appears to be suitable for use on a production basis.

According to the analytical procedure developed by Serfass and Levine, copper is isolated from the other constituents in the nickel plating bath by precipitation with 2-mercaptobenzothiazole and extraction of the precipitate with amyl acetate. Colorimetric techniques are utilized for quantitative determination of the amount of copper extracted. The color is developed by addition of dibutyl amine and carbon disulfide. After the solution has been diluted to 25 ml. with ethyl alcohol, its transmittancy is measured using a Klett-Sommerson colorimeter with blue filter No. 42, and the concentration of copper read from a calibration curve.

* * *

An Accelerated Atmospheric Corrosion Test for Organic Coatings

THE results of experimental work carried out at the Chemical Research Laboratory, British Iron and Steel Research Association, and recently reported by R. St. J. Preston, have shown that a simple condensation-corrosion test affords a means of evaluating, within a reasonable time, the comparative corrosion resistances of the commoner types of protective coatings as well as methods for pretreatment of steel before painting. (See also "Journal of the Iron & Steel Institute"—November 1948). The test was originally designed for comparing the corrosion resistance of protective coatings of the paint type applied to steel surfaces with and without a phosphate type pretreatment; however, it was pointed out by Preston that the test may also be useful for com-

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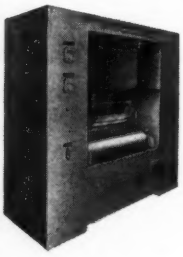

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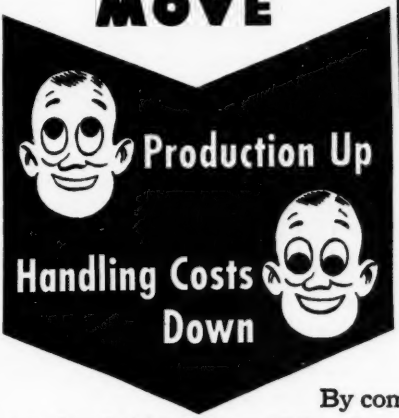

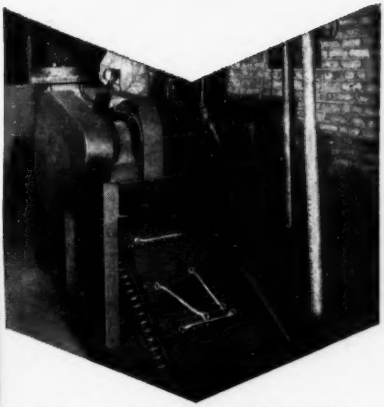

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paring the corrosion resistance of metallic coatings.

Since the test apparatus was principally designed for comparing the corrosion resistance of materials intended for use in an industrial atmosphere, without unduly prolonging the time of test, a sulfurous type of atmosphere was adopted. Besides representing the main atmospheric constituent responsible for accelerating corrosion, it was pointed out that sulfur dioxide can be used directly without the complication of spraying devices essential for salt or sulfuric acid-spray tests. It was also pointed out that the condensation-type corrosion test can also be used as a humidity test.

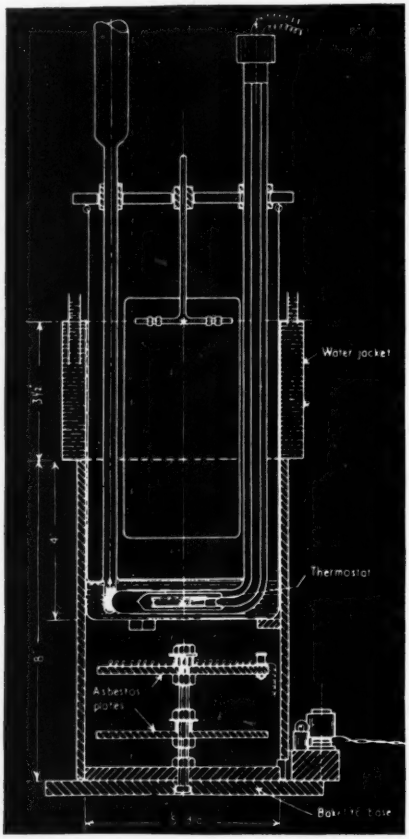

Fig. 3—Diagrammatic sketch of apparatus used for accelerated corrosion testing of coatings under conditions simulating industrial atmospheres
(Illustration courtesy "J. Iron & Steel Inst.")

Type of Apparatus Used

The apparatus used in the corrosion test consists mainly of a large beaker, the lower part of which is heated and the upper part cooled, thereby ensuring, in the presence of a small amount of water in the beaker, an atmosphere of 100 per cent relative humidity. The experimental work described was conducted in this type of apparatus which was heated by an external steam coil. Considerable advantage can be evidenced by the use of a thermostatically controlled electrical element for heating. A diagrammatic sketch of such a test apparatus utilizing electrical heating is shown in Fig. 3.

In referring to the test apparatus shown in Fig. 3, a 3-liter tall-form lipless beaker of high-resistance glass rests on three studs in an asbestos-cement tube of 5 in. diameter. The heater element of 36 S.W.G. (0.0076 in. dia.) nickel-chrome wire giving 75 watts (720 ohms at 230 volts) is fixed on an asbestos base about 1½ inches below the beaker, but is adjustable in height. The element is connected in series with a simple bi-metallic strip type of thermostat sealed in an evacuated glass tube. To avoid contact of its leads with the corrosive solution in the beaker, the thermostat is enclosed in a glass tube, bent as shown in Fig. 3 so that it lies across the bottom of the beaker and below the surface of the solution. In this way, it was pointed out by Preston, the temperature of the solution is maintained constant within a range of about 2-3 deg. C.

The upper part of the beaker is cooled by means of a "compo" cooling

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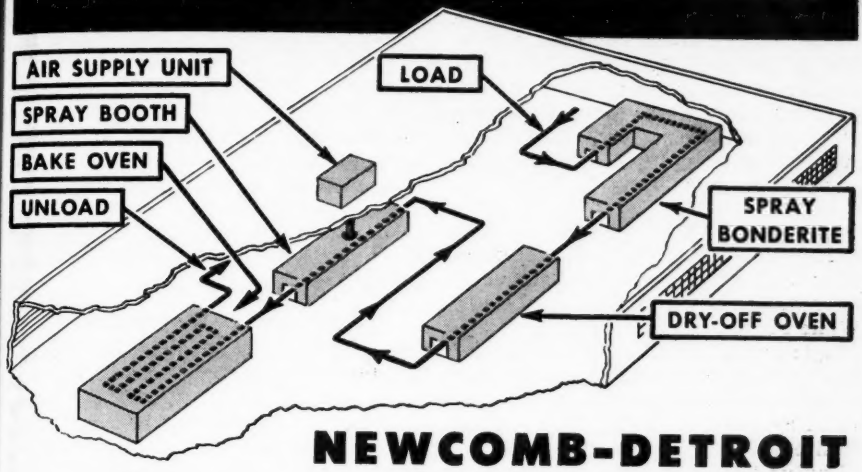

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coil or by an annular condenser of brass as shown in Fig. 3. The cooling arrangement maintains atmospheric saturation in the upper part of the test beaker at a reasonably constant temperature. The lid of the beaker is made from ¼ inch resistant plastic and is provided with holes for thermometers, tap funnels, specimen support and thermostat tube. The lid rests on a seating made from thin-walled rubber tubing, split along its length and clipped at the ends.

Method of Testing

The test specimens are suspended from a glass support at a distance of approximately 1 inch from the center. While the apparatus may be used as a simple small scale humidity test, the more corrosive atmospheres indicative of industrial test conditions are provided by sulfur dioxide; either sodium sulfite and acid, or a straight solution of sulfur dioxide in water may be used. The initial concentration used in the tests is approximately 0.015 grams of sulfur dioxide per 100 ml. of solution, the test solution being renewed each day. Weaker solutions of sulfur dioxide may be satisfactory for some tests.

The total amount of sulfur dioxide solution in the beaker is about 300 ml. In beginning the test heat is applied through the heating elements and a rapid flow of cooling water is passed through the jacket. A wide range of temperatures is available; however, it was pointed out by Preston that to secure adequate condensation on the specimens a temperature not less than 113 deg. F. is desirable.

Evaluation of Test Results

It was brought out by Preston that the duration of test periods and assessment of corrosion vary with the type of material undergoing test and the degree of acceleration. In the case of single coats of paint on steel, plain and

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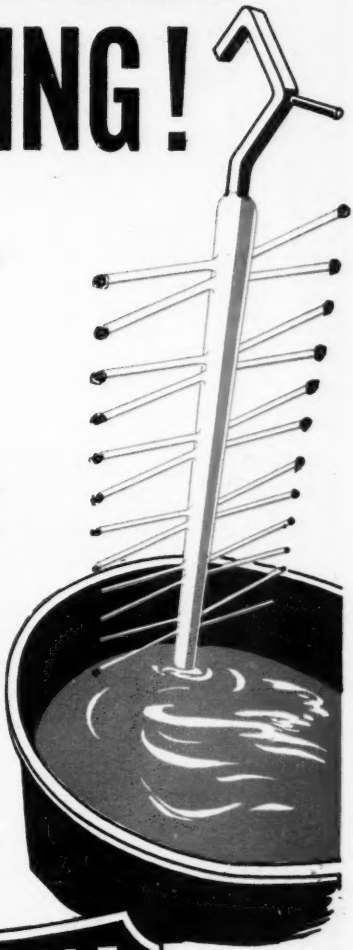

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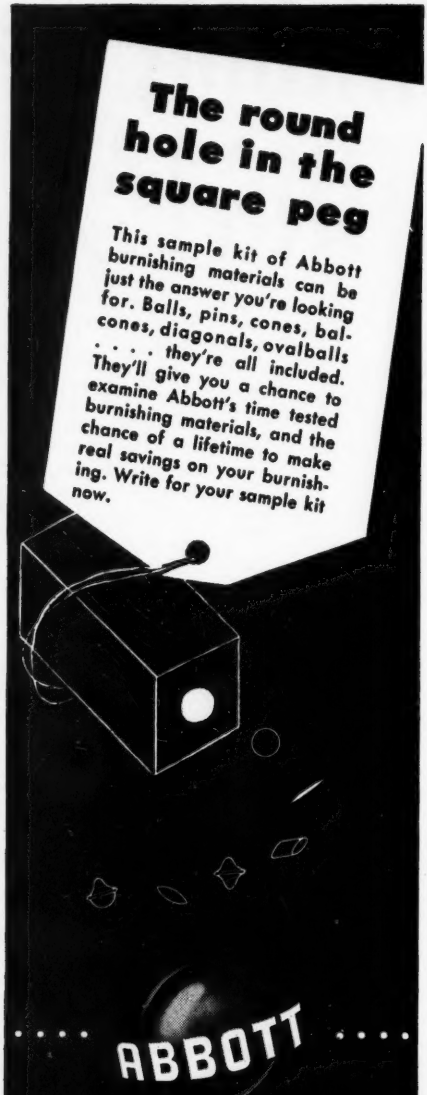
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phosphate-treated, differences in degree of corrosion are shown within a week, even when more dilute sulfur dioxide solutions are used as the test medium. Two methods of evaluation of corrosion results were indicated: (1) gain in weight due to formation of corrosion products; (2) visual examination, which may be made with or without the aid of a light-reflection meter. In the case of unprotected metals the determination of loss in weight on removal of corrosion products affords a more reliable criterion particularly when the corrosion is heavy. The reproducibility of the test results using this type of apparatus was described as good. It was found that there was a sufficiently wide margin between the corrosion of phosphated and untreated painted steel, as measured by weight increases, to furnish a quantitative basis of comparison for this type of metal finishing operation.

* * *

Proper Heating Important in Galvanizing Operations

THE maintenance of proper temperature in the galvanizing pot is important both as to rate of production and life of the kettle, as well as to the quality of coating applied to the steel surfaces undergoing the galvanizing treatment. The proper heating of the galvanizing kettle is often the bottleneck in galvanizing operations. These facts were pointed out by W. O. Owen, Surface Combustion Corporation, in discussing modern heat applications in galvanizing in a recent issue of "Steel Processing" (December 1948).

Sufficient heat must be supplied to maintain the galvanizing bath at proper and uniform temperature; in addition the product entering the bath must be heated to galvanizing temperature. Also, heat losses must be off-

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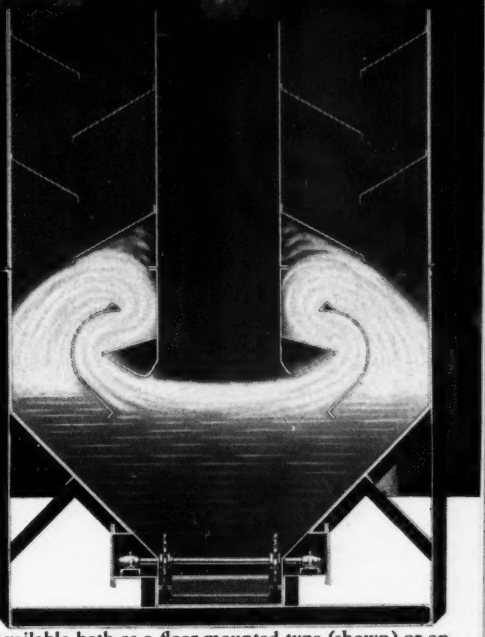

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set. For economical operation it is important that all three of these requirements be met with minimum erosion of the kettle and the equipment in which it is mounted. Any shortcomings of equipment, along any of these lines, will reduce the rate at which the product can be economically galvanized and may also affect the quality of the coating produced.

The heat losses occurring in galvanizing operations were classified by Owen under the following four groupings: (1) radiation from the refractory setting surrounding the kettle; (2) radiation from the top of the bath; (3) heating of the product to be galvanized; and (4) heat required to melt the zinc supplied to replace that carried out of the bath on the galvanized parts. It was brought out by Owen that the destructive action of molten zinc on steel increases very rapidly as the temperature increases above 870 deg. F. For instance, if the temperature of the inside of the kettle where it comes in contact with the molten zinc is increased to 950 deg. F., the rate of corrosion of the kettle surface is approximately seven times that at 870 deg. F.; whereas, at 1000 deg. F. the corrosion rate is 17 times that at 870 deg. F. In addition to affecting kettle life, the rate of corrosion also influences the rate at which dross is formed in the bottom and along the sides of the kettle. This dross, by serving as an insulator, can retard the rate of introduction of heat into the zinc metal.

Direct Fired Burners

According to Owen the most popular method of firing galvanizing tanks and the one in general use makes use of direct-fired burners, with gas as the best accepted fuel. Gas lends itself readily to being burned in small quantities through a multiplicity of burners. Thus, uniformity of temperature

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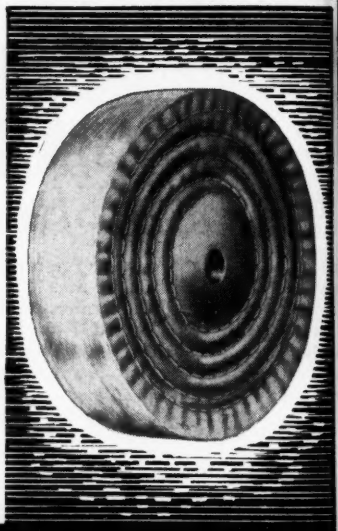

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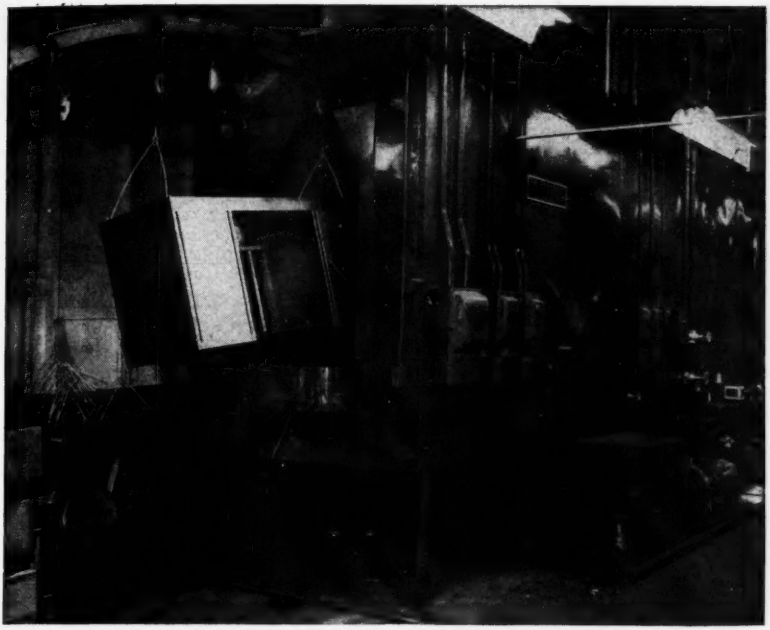

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may be secured over the absorbing area of the kettle.

It was pointed out that in the majority of installations practically all of the absorbing area is along the side walls of the kettle. The area is usually measured from the top of the zinc in the kettle to a point 6 or 8 inches from the bottom of the inside of the kettle.

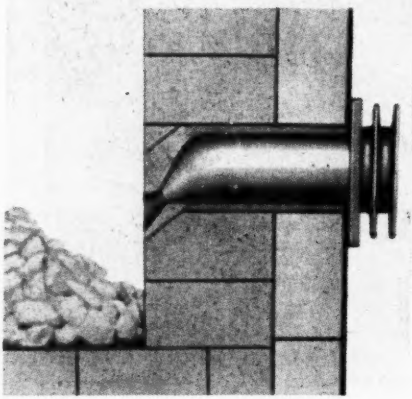


Fig. 4—One type of firing in use for hot dip galvanizing operations known as the surface combustion "impact bed method." In heating of this type there is no direct flame impingement on the kettle.
(Illustration courtesy "Steel Processing")

It is good practice to protect the section near the bottom of the kettle with tile to prevent heating at the dross line, since, as has been pointed out, the dross acts as an insulator. According to Owen one burner is used for about one foot of kettle length. An example cited is that a 12-foot kettle would require 12 to 14 burners which would be staggered along the side walls of the kettle. If the furnace was 4 feet deep from the top ledge to the bottom burners would normally be positioned 18 to 19 inches from the bottom, and since a tile is located in front of the burner, between the burner and the kettle, the hot gases make contact with the kettle approximately 24 to 26 inches above the inside kettle bottom.

One type of firing was termed by Owen as the Surface Combustion "impact bed method." A mixture of gas and air is delivered through a low pressure inspirator, or if sufficient gas pressure is available through a high-pressure inspirator, to a burner nozzle that discharges the mixture onto a refractory bed, as is illustrated in Fig. 4. The hot gases produced in the refractory bed pass over the tile first up, then down the sides of the kettle to a collecting flue which is normally positioned at the bottom of the kettle. There is no direct impingement of flames on the kettle, the system described as producing a uniform heat.

Convection Heating

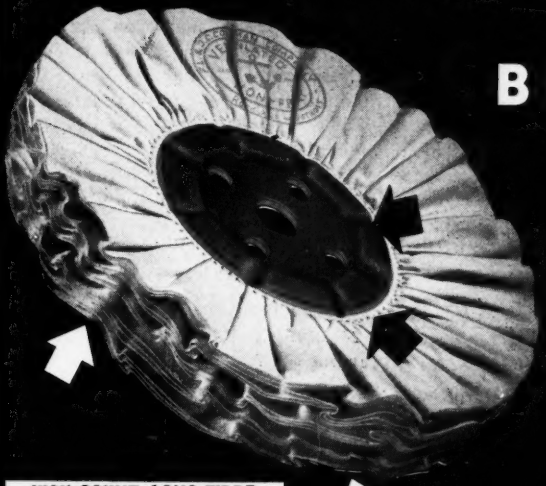
In convection heating, it was pointed out by Owen that heat may be applied in two ways: first, by heating from a burner firing into a tunnel at one end of the setting; second, by the use of an air heater located at some external point. By the use of either method the products of combustion and diluent air are rapidly circulated on the side and walls of the kettle by means of fans.

Heating by Radiant Tubes

By placing radiant tubes around the kettle the type of heating obtained is similar to that from electric elements, except that gas is used as fuel. Based on Owen's description, the radiant tube of surface combustion design employs a semi-diffusion type of combustion within the tube. The advantages are a uniform release of heat along the entire length of the tube. Thus, it can be seen that a number of tubes mounted within the setting would provide a very uniform flow of heat to the kettle by radiation from both the tubes and the setting. Although the direct-fired heating method is the most widely used it was pointed out by Owen that neither the

REAL-VENT
NON-FRAY

BUFF



VENTILATION CHANNELS

Deep, non-compressible ventilating channels keep the REAL-VENT cool at all speeds. Cool buffs WORK LONGER AND MORE EFFICIENTLY.

THIN CENTER

The REAL-VENT'S thin center makes it possible to group buffs for a denser, fully ventilated face. Greater density promotes GREATER SHOP PRODUCTION.

HIGH-COUNT, LONG FIBRE COTTON CLOTH

Only the thread ends of best grade muslin, which is pieced together and cut on the bias, are exposed to wear, thus eliminating parting of long threads from the cloth. The REAL-VENT WILL NOT FRAY, STAYS LONGER IN SERVICE.

RUFFLED CONSTRUCTION

Shirring of the cloth produces pockets which hold buffing compound at high or low speeds. The REAL-VENT'S pocketed face prevents lining out, SAVES TIME AND MATERIAL.

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CODMAN
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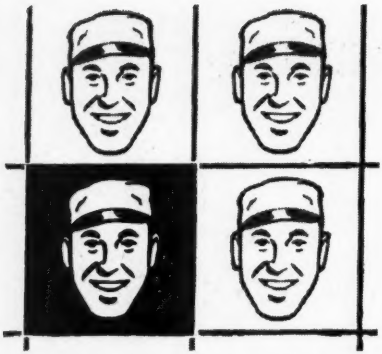
ROCKLAND · MASSACHUSETTS



ALL GOOD WORKERS . . .
but one does MORE than the job assigned!

Like an ambitious, able workman, Parco Cleaners do more than they are required to do.

Parco Cleaners do more than remove grease and soil. The line of specialized metal cleaners formulated by Parker *condition the metal for the next step in finishing.*

When you use a Parco Cleaner, factors in addition to the type of soil determine the type of cleaner to be used. The experienced metal finishing expert from Parker Rust Proof Company will help you select the cleaner that will contribute most to the economical, efficient production of the finish on your product.

Whether your production calls for cleaning before a Parker Process, general cleaning, or cleaning before plating, use a Parco Cleaner!

- **ALKALI CLEANERS**
- **EMULSION CLEANERS**
- **ACID CLEANERS**
- **WATER CONDITIONERS**

Bonderite, Parco, Parco Lubrite—Reg. U. S. Pat. Off.

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radiant tube nor convection method has had sufficient use to judge them thoroughly against the direct-fired kettle.

One other factor of importance to galvanized finishes, which was brought out by Owen, is that there must be ample zinc capacity in the kettle per pound of product in order to avoid overworking with high firing rates and possibly overheating. The figure of 18-24 pounds of zinc per pound of production was cited as a general value. Excessive overfiring may often be prevented by reducing the surface radiation loss.

* * *

Improved Method for Treatment of Waste Pickle Liquor

INVESTIGATIONS conducted at Mellon Institute on methods for treatment of waste pickle liquors have resulted in the development of a neutralization process whereby a sludge can be produced that settles to a much smaller final volume than can be attained in conventional neutralization methods. This is of interest to finishing plants having waste pickle liquors to dispose of in view of the increasing demand for effective treatment of such wastes before they are discharged into streams, lakes or other places of disposal. The work was carried out as a part of the research program of the Stream Pollution Committee of the American Iron and Steel Institute, and was reported by Richard D. Hoak and Charles J. Sindlinger in a recent issue of "Industrial & Engineering Chemistry," published by the American Chemical Society.

Where pickle liquor is treated with lime, the supernatant liquor that separates is iron-free, and according to Hoak and Sindlinger's interpretation

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it should be possible to discharge it directly to a stream or to a municipal sewer. It was pointed out that in practice the volume of this liquor is usually so small relative to the total sludge volume that all the slurry is stored in lagoons with no provision for drawing off the clear liquor. Thus, solar evaporation and percolation into subsoil are depended on to dissipate the liquor that separates. It can be seen that a simple method for reducing the final sludge volume would have great value in solving waste pickle liquor treatment problems, since many plants in metropolitan areas cannot resort to lagoons for sludge disposal.

Controlled oxidation of the ferrous hydrate to ferrosoferric oxide is the fundamental principle on which the process operates. Basically, the process developed by Hoak and Sindlinger consists of feeding pickle liquor at a predetermined constant rate to a bath in a reactor, where the temperature is maintained above 167 deg. F. and a means is provided for efficient aera tion. The neutralizing agents investi gated consisted of magnesia, high cal cium quicklime, and dolomitic quick lime. A decision on which agent to us will depend principally on economi considerations. The settling rate of th slurry made by this process is high sedimentation being virtually complet in less than an hour in most cases.

The experimental reactor employe by Hoak and Sindlinger in the waste pickle liquor studies is shown diagram matically in Fig. 5, and consists of section of steel pipe bolted to a stee base. Aeration is supplied by thre shrouded impellers, mounted equi-dis tant on a shaft, with a separate ai supply for each. In the studies reporte the impellers were driven at a peri pheral speed of 700 feet per minute A vertical baffle, extending the fu length of the reactor, furnished th necessary turbulence. As is shown

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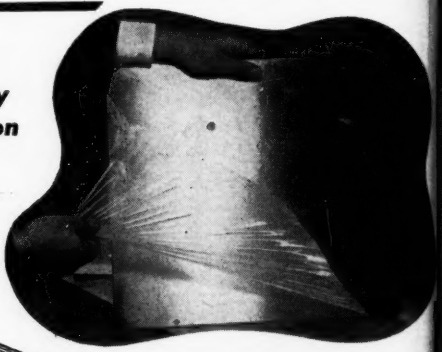

This new Striplastic Strippable Spray Booth Coating is shipped in a consistency so that it can be extended 20% or 30% by the addition of an inexpensive reducer. Ask us how.

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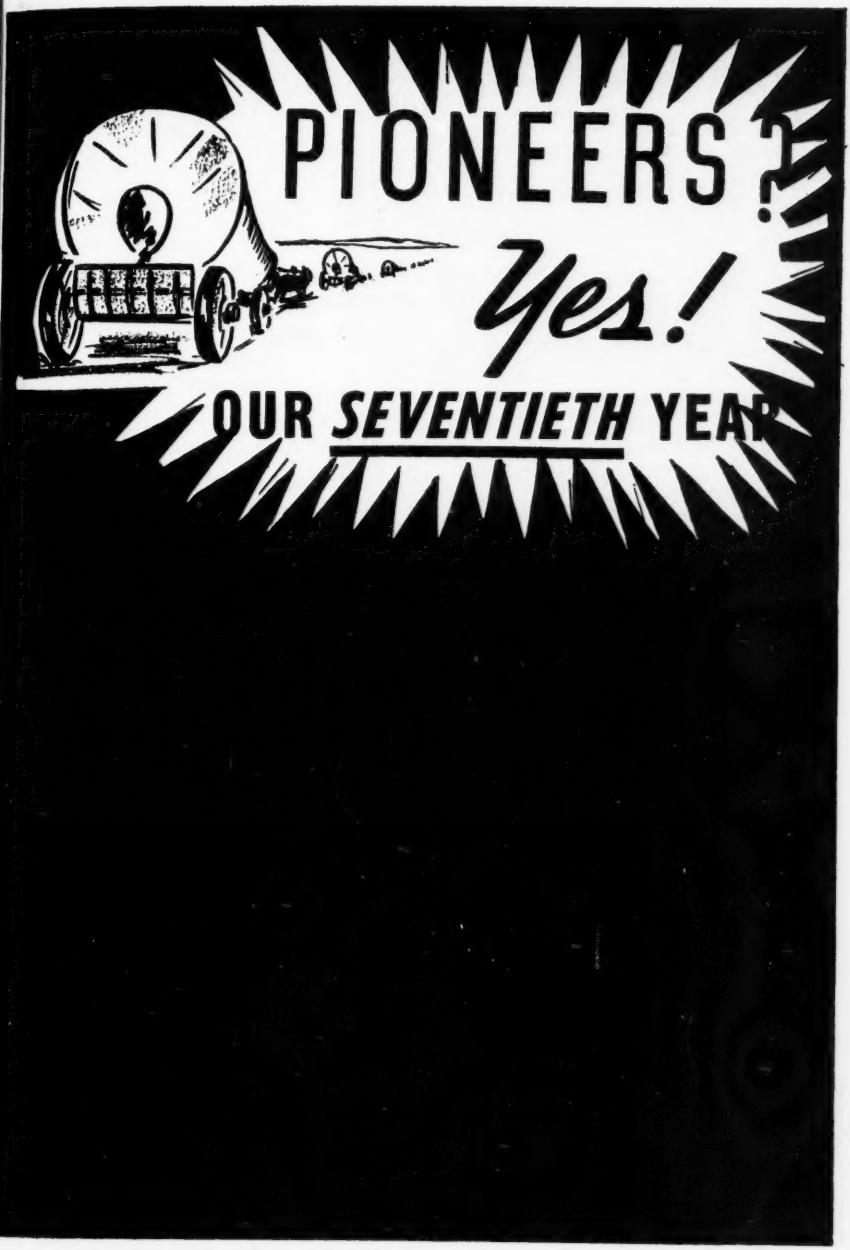
Among many advantages, it is non-toxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.


PIONEERS?
Yes!
OUR SEVENTIETH YEAR

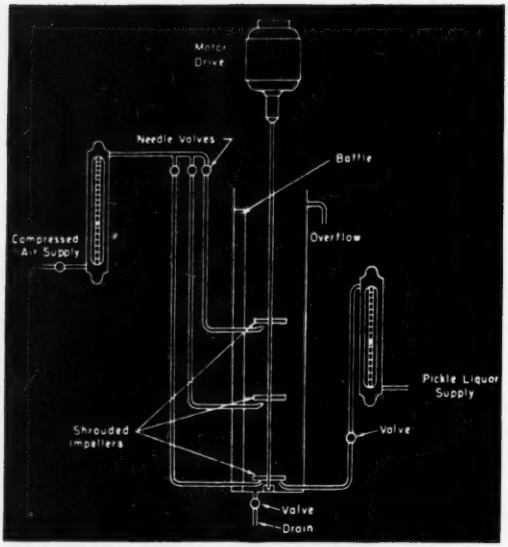


Fig. 5—Experimental reactor used at Mellon Institute for study of new process for waste pickle liquor treatment. Aeration was provided by three shrouded impellers mounted on a shaft with a separate air supply for each. (*Illustration courtesy "Ind. & Eng. Chem."*)

waste pickle liquor was admitted from a reservoir through a tube discharging below the lowermost impeller.

The choice between dolomitic lime and high calcium lime as a neutralization agent will depend largely on local conditions. However, the studies conducted showed that high calcium lime can be used in a manner that will separate quickly a considerable volume of supernatant liquor for discharge from a sedimentation basin. Also, where it is necessary to dispose of the sludge by trucking it to a dump, this agent yields a slurry that filters rapidly to a cake of low moisture content.

An experimental fire fighting suit employing an aluminum foil cotton lamination has been developed by the Clothing Branch of the Aero Medical Laboratory, Engineering Division, Air Materiel Command, Dayton, Ohio. Approaching 100 per cent in its ability to reflect the infra-red rays of radiated heat, the principle of the suit and its merits have been well established. It has been designed especially to meet an increasing demand for greater protection to personnel engaged in combating high-temperature fires—particularly those involving gasoline and fuel oils.

Permitting much greater ease of movement and less donning time than conventional protective garments, the complete aluminum foil suit weighs 8.32 lb. as compared with the 22.05 lb. and 43.84 lb. weights of the two other suits used in the experiment.

Vision plate, developed by the Materials Laboratory, Engineering Division, Air Materiel Command, is a high-vacuum deposit of gold on glass which serves as an excellent reflector of radiant heat while passing visible light; however, future models may use a less expensive heat-absorbing instead of heat-reflecting glass because this is now considered to be sufficient for the degrees of heat against which the suit is to be used.

What are believed to be the largest tanks ever lined with rubber will be used in a New Jersey plant for the storage of weak sulfuric acid. The two tanks have been lined by The B. F. Goodrich Company, a pioneer in this field.

The tanks each hold 2,000,000 gallons and require 30 tons of rubber in the 3/16-inch linings. They are flat bottomed, 100 feet in diameter, with a dome top 45 feet high at its tallest. The main body of the tank is 30 feet high.

719 PAINT FINISHERS ..... *Can't Be Wrong!*

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Removes Oil and Rust . . . And Anchors Paint To Metal . . . .

Over 3,000,000 gallons used in the last 10 years . . . Etches metal and coats with phosphate . . . Non-inflammable . . . Economical (dilute one volume of SOL-KLEAN with 3 volumes of water) . . . Apply by brush or dipping—wiped or washed off!

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NEWS of the Industry

NEW PLANTS

The Black Arrow lines of paint spray equipment and "Millburn" oxy-acetylene welding and cutting apparatus are now being produced at the **BLACK MANUFACTURING COMPANY'S** newly constructed plant at Parkton, Maryland, twenty-five miles north of Baltimore, according to S. Duncan Black, Jr., president.

Utilizing modern construction and layout, the new factory's greater space and expanded facilities meet growing production needs, and the spacious office section provides for efficient handling of increased administrative and clerical work.

COMPANIES

DETREX CORP., DETROIT 32, MICH., is extending the use of the registered trade name "Detrex" for identification of the alkali cleaning compounds, strippers, emulsion cleaners, and wet spray booth materials that they manufacture.

The trade name "Detrex" is followed by a number or letters to indicate the different materials to which it is applied. These identifying numbers or letters are not being changed.

The registered trade name "Triad" is now being reserved exclusively for use in identifying Detrex Corporation's chlorinated hydrocarbon solvents for vapor degreasing and oil extraction.

THE DETROIT PLATING INDUSTRIES, Detroit 7, Mich., has announced a change in ownership. Louis S. Morse, Jr. is the new president and general manager, replacing H. A. Molt, who has resigned as the active head of the organization. P. H. Henning will continue as production manager and assistant to the new president.

LEA MANUFACTURING CO. OF CANADA, LIMITED, 370 Victoria St., Toronto 2, Ont., has been formed to manufacture and distribute the Lea line of polishing, buffing, and burring compositions, including Lea Compound and Ad-Lea-Sive. All products made in the Canadian plant are manufactured to original Lea specifications and under the guidance of the technical staff of The Lea Manufacturing Co., Waterbury, Connecticut.

Officers of the Canadian company are: Dr. Henry L. Kellner, president; Earle W. Couch, vice president; and Kergan Wells, secretary and general manager.

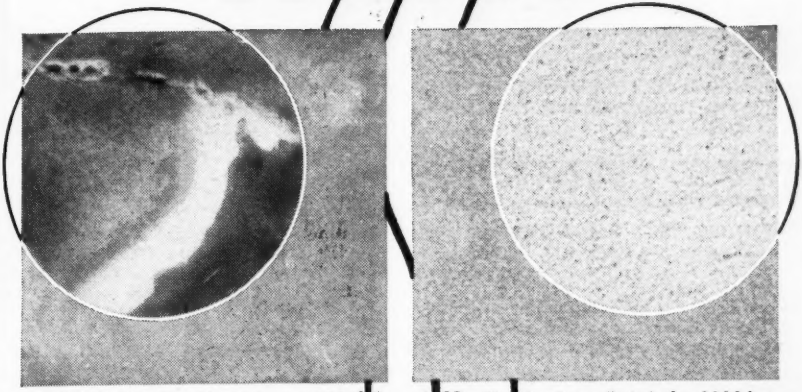
Wilfred S. McKeon, president of **SULPHUR PRODUCTS CO.,** Greensburg, Pa., manufacturer of "Zinc-Brite," "Liquid Sulphur," and "Tinstrip," announces that C. H. Holmer has been granted exclusive distribution of the company's products in several Southeastern states.

Mr. Holmer will make his headquarters in Atlanta, Georgia, and will handle the sales and service of the special chemicals manufactured by the Sulphur Products Company in the States of North and South Carolina, Georgia, Florida, Alabama, and the eastern half of Tennessee.

S. Duncan Black, Jr., president of the **BLACK MANUFACTURING CO.,** Parkton, Md., has announced the appointment of the H. B. Parke Co., Pittsburgh, Pa., as factory representative for the Black

MICO SILICONE-BASE FINISH SOLVES YOUR FINISHING PROBLEM WHEREVER THERE IS

HEAT



ORDINARY FILM—Total breakdown at 1000°F)

MICO—Film integrity unaffected after 1000 hrs.

In this dramatic test by a nationally known laboratory the steel plate at the left was coated with ordinary heat-resisting material, while the one at the right was coated with MICO Aluminum. Both were then subjected to 1000° heat. As the unretouched enlarged sections show, the ordinary film completely broke down after only one hour. But MICO held up without signs of deterioration and was still going strong *after 1000 hours!* What further proof of MICO'S amazing durability! MICO can protect YOUR product, too, *wherever there is heat!* Investigate MICO today!

Write for complete details.

Arrow line of industrial paint spray and welding equipment in the western Pennsylvania-West Virginia area.

PILLSBURY CHEMICALS, Detroit 30, Mich., manufacturer of drawing compounds, announces the appointment of J. Frank Daly and Associates, Hartford, Conn., to handle the distribution of its products in the New England area.

MAGNA MANUFACTURING CO., INC., New York, N. Y., manufacturer of Magnaflake metal powders and pastes, has announced the association of A. M. Russell, its Texas representative, with the Scientific Supply Company of Texas, 1116 Hemphill St., Houston 13.

NEW POSITIONS

DAVID M. FLAUMENHAFT has joined the Lacquer & Chemical Corp., Brooklyn, N. Y. A chemical engineer graduate of the University of Michigan, Mr. Flaumenhaft did graduate work in protective coatings and has had considerable experience in the synthetic resin field.

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SMALL PARTS
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speed lathes
Users report savings of from 30% to 90% in secondary finishing costs when Schauer Speed Lathes are used. Learn how you can use these low-cost, high-production machines. Save with Schauer.
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THE SCHAUER MACHINE CO.
• Originators of Today's Speed Lathes
2065 Reading Rd., Cincinnati 2, Ohio, U.S.A.

According to an announcement made by G. B. Work, assistant general manager, **JOSEPH H. HARRIS** has been appointed manager of customer service at the North Chicago branch of the Industrial Finishes Department, Atlas Powder Company.

Mr. Harris was formerly with the R. N. Nason Company and the Pittsburgh Plate Glass Company.

Joseph H. Harris

ALLEN D. RUSSELL has been named sales representative for the Michigan Chrome and Chemical Company, covering the States of Ohio, Pennsylvania, and New York, as well as Canada. He succeeds Frank Jones who was recently transferred to the Eastern States.

According to an announcement by R. M. Koch, general manager, **ERNEST B. HALL** has been appointed industrial sales representative in the Chicago area for George Koch Sons, Inc., Evansville, Ind., manufacturer of finishing systems, spray booths, ovens, and washing and phosphatizing equipment.

E. R. Baxter, director of Sales and Sales Administration of The Carborundum Co., Niagara Falls, N. Y., has announced the following changes in district sales office personnel:

F. H. APPENRODT, for many years office manager of the Pittsburgh district sales office, has resigned. **H. P. ERBE,** former office manager of the Cleveland office, has been appointed to succeed Mr. Appenrodt.

R. L. HEIMSTADT, former assistant office manager of the Detroit office, has been promoted to the position of office manager of the Cleveland district to succeed Mr. Erbe.

D. S. MASSON has been promoted to the position of assistant to the district sales manager in Detroit.

J. H. DENTON has been appointed manager, Sales Administration, home office, succeeding Mr. Masson.

H. Harris

Why BUNATOL ?

DOES MORE FOR LESS MONEY

BUNATOL No. 1000 Paste insulation for plating racks actually gives more insulation value for less money. Why not let us prove this statement by insulating one of your racks for a test in your tanks.

Good rack insulation helps to reduce production costs and reduce rejects. When you realize that you can have "good" insulation for so little cost-per-rack then it pays to investigate.

No. 1000 Paste insulation is the plastisol type of 100% solids which forms a very thick and tough coating in a single dip. The insulation will withstand all the usual plating solutions and cleaners except the degreaser. Application is quick—saves labor and time. Usually No. 1000 insulation can be expected to remain in service for months.

Costs today are important and this applies as much to insulation as any other item. No. 1000 Paste is surprisingly low in price and high in quality. It does more for less money.

BUNATOL is made by insulation specialists who make only chemically resistant insulation for all types of severe problems. Why not test No. 1000 on one of your racks?

NELSON J. QUINN COMPANY • TOLEDO 7, OHIO

DR. FRANK J. ZVANUT will head the newly-formed Clay Division of the Ferro Enamel Corp., Cleveland, Ohio, which

Frank J. Zvanut (left), Earl Skillicorn

will handle the distribution of porcelain enamel, pottery, and special purpose clays now being produced at the company's recently built plant at Nashville, Tennessee.

A chemical engineer, Dr. Zvanut has been associated with Ferro since 1936, joining the company as a member of the research and development staff. During the war and prior to his present appointment, Dr. Zvanut was manager of Process and Quality Control for Ferro's Frit Division. He is the author of several technical papers on clay and was instructor of Ferro's 1949 Training Course for porcelain enamelers.

EARL SKILLICORN has been named manager of Process and Quality Control, succeeding Dr. Zvanut. He joined the Ferro Control Laboratory shortly after his graduation from Kent State University in 1935. In 1937 he joined the Seeger Refrigerator Co., Evansville, Ind., as manager of control, and in 1940 was appointed porcelain enameling superintendent. He rejoined Ferro in 1942 and worked on war products, later assuming charge of the company's Customer Service Laboratory.

DR. W. E. HANFORD, director of petroleum and chemical research since January 1948, was elected a vice president of the M. W. Kellogg Company on March 30, it was announced by H. R. Austin, president.

Dr. Hanford, scientist, who has been nationally prominent in many fields of research, joined the Kellogg organization in 1946. Previously, he had been associated with the General Aniline & Film Corporation as director of research.

CECIL B. ROBERTS, sales representative for Pennsylvania Salt Manufacturing Company's B-K Division in Southwestern United States for the last eight years, has been named a product supervisor of the division, it has been announced by S. H. Crounse, manager of sales.

Mr. Roberts, whose headquarters are in Oklahoma City, Oklahoma, will assume the duties of training Pennsalt salesmen in the western section of the country.

Election of **W. P. FULLER, III** as a director of W. P. Fuller & Co. has been announced by President A. H. Brawner.

Mr. Fuller, a great-grandson of the company's founder, is manager of the firm's Glass Division and in charge of labor relations. His election to the board was announced as W. P. Fuller & Co. opened its centennial year. Mr. Fuller's great grandfather, the original William Parmer Fuller, came to California in 1849 to establish the business which today bears his name.

W. P. Fuller, III

Mr. Fuller is the son of W. P. Fuller, Jr., who served as president of the company from 1924 to 1946. He is the first member of the fourth generation of the Fuller family in California to serve on the board.

Mr. Fuller joined W. P. Fuller & Co. in 1937. From 1941 to 1945 he was on active duty with the U. S. N. R., entering the service as an ensign and returning from duty as lieutenant-commander. He served overseas in the Philippines and Japan.

In April, 1946, Mr. Fuller was appointed manager of the company's Glass Division and placed in charge of labor relations. In addition he will serve on the board of directors as assistant secretary.

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SHORT-CUT fibres of all types used to produce effects of suede, felt, velvet, mohair, velour, carpet on any surface in an economical manner.

LET our 25 years experience be your guide to quality results at lowest possible cost.

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H. R. MEININGER CO.
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Denver, Colo.

J. GORDON SMITH CO.
3901 Main St.
Dallas, Texas

Thomas F. O'Brien

MacDermid Inc., Waterbury, Conn., has announced the purchase of the manufacturing and distribution rights of Troxide Compounds from the Waverly Petroleum Products Company of Philadelphia. Simultaneously, MacDermid announces that **THOMAS F. O'BRIEN,** who formerly headed the Industrial Chemical Division of Waverly, will take charge of a newly formed department to develop and promote Troxide and allied salt compounds for metal products finishing. Mr. O'Brien, a metallurgical engineer, was formerly associated with the Philco Corporation and General Motors Corporation, in addition to acting as consulting engineer to several large corporations.

Appointment of **GEORGE J. MARTIN** as special sales staff assistant with the Diamond Alkali Company has been announced by Fred W. Fraley, sales vice president. He will be located at the company's general headquarters in Cleveland, where he will work under the direction of Charles E. Grant, manager of chromium chemical sales.

Ralph G. Golseth

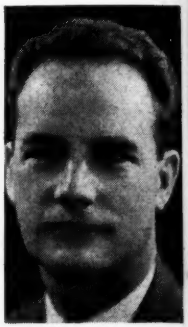
RALPH G. GOLSETH, vice president in charge of the Soya Products Division of The Glidden Company, has been elected a director of the company, according to Dwight P. Joyce, president.

Mr. Golseth joined The Glidden Company in 1945 as assistant vice president in the Soya Products Division, and was elected a vice president in August 1947. He maintains his headquarters at Chicago.

WILLIAM H. HEALEY, formerly associated with Arthur D. Little, Inc., has been appointed supervisor of market research for Antara Products, a division of General Aniline & Film Corporation, according to an announcement by Harold G. Shelton, general manager of the division.

Mr. Healey, who was a private consultant before his association with Arthur D. Little, Inc., will be concerned chiefly with the division's surface active agents and acetylene chemicals.

The Electric Products Co., Cleveland, Ohio, recently appointed **E. LOWE MCINTYRE, JR.,** as assistant sales manager in charge of New Market Developments. Mr. McIntyre will be located at the company's headquarters in Cleveland.



E. Lowe McIntyre, Jr.

An electrical engineer graduate of the University of Pittsburgh, Mr. McIntyre spent nine years with the Westinghouse Electric Corporation in industrial selling and five years with Jack & Heintz Precision Industries, Inc., doing staff work and as sales manager of the electric motor division.

Several shifts in the top executive staff of The Dow Chemical Co., Midland, Mich., were made April 5 by the board of directors as a result of the death March 31 of Dr. Willard H. Dow, president.

EARL W. BENNETT, treasurer of the company since 1930, was elected chairman of the board, and **LELAND I. DOAN** was elected president of the company. Mr. Doan had been a vice president since 1938 and secretary since 1941. **DR. MARK E. PUTNAM,** a vice president since 1942, was named general manager. Dr. Dow had formerly held all these positions.

Two new vice presidents also were named: **DR. A. P. BEUTEL,** who is general manager of Dow's Texas Division, and **RUSSELL L. CURTIS,** general manager of the Great Western Division. **CARL A. GERSTACKER** was elected

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RAKES . . . SPINNERS . . . TUBE POLISHING MACHINES

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You'll find this modern wheel rake safe, fast and economical. It will recondition and shape polishing wheels and buffs with a minimum loss of material and without hazard. Write for complete details and prices.

Tube Polishing Machines Improve Workmanship

Rubber rolls tapered against each other drive tubing across face of polishing wheel or abrasive belt. Tube machine produces a uniform finish, free from spiraling. It polishes tubes from ¾" to 5" in diameter.

Work Holding Spinners For Uniform High Speed Polishing and Buffing

Here's a spinner for holding work and producing uniform high speed polishing and buffing. It has totally enclosed grease packed ball bearing construction. Removable fixture flange has machined face and screw holes for attaching wood block or other fixtures. Write for complete literature and price quotation.

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• METAL FINISHING SUPPLIES AND EQUIPMENT •

New Diversey field service engineers: (left to right) A. J. Crouch, P. M. Saxman, W. H. Murphy, E. F. Manning and E. V. Hall

treasurer and **CALVIN A. CAMPBELL**, the firm's legal counsel, was elected secretary.

A. J. CROUCH, P. M. SAXMAN, W. H. MURPHY, E. F. MANNING, and **E. V. HALL** are recent additions to the staff of field service engineers of the Metal Industries Department of The Diversey Corp., Chicago 4, Ill. Before entering their territories, these service representatives were required to complete an extensive course of technical training covering all phases of surface preparation and metal finishing.

Directors of The Glidden Company have elected **CLIFTON M. KOLB** senior vice president and member of the executive committee, according to an announcement by Dwight P. Joyce, president.

Mr. Kolb, who has been secretary of the company since 1929, began his career with Glidden in 1922 as head of the legal department. He was appointed assistant secretary in 1923 and elected a director of the company in 1938.

LYNN F. BARNETT, sales manager of the Export and Industrial Finishes Division of the Central Paint & Varnish Works, Inc., Brooklyn 1, N. Y., has been appointed general sales manager of all divisions. Mr. Barnett, who was elected a vice president in 1946, has been with the company for nine years.

The retirement of **FREDERICK L. THEURER,** divisional director of the Milwaukee Paint Division, Pittsburgh Plate Glass Company, has been announced by E. D. Griffin, vice president. Mr. Theurer will be succeeded by **M. R. RANDLETT,** who has served as his assistant since 1945.

Mr. Randlett, the new divisional director, joined the company's Houston warehouse after his graduation from Rice Institute in 1922. In May 1931 he became trade sales manager of the Milwaukee organization and assistant divisional director in 1945.

JOSEPH DAHLE, formerly research director of the Symco Chemical Corporation and the Aspinook Corporation, has been appointed director of research for The Atlas Mineral Products Co., Mertztown, Pennsylvania.

F. C. CARD has resigned as assistant production manager of the Wannamaker Chemical Company to accept an appointment as district manager of materials of chemical construction sales for The Atlas Mineral Products Company in the eastern New York and New England territory.

JAMES H. FRY has joined the Atlas Mineral Products Company as a research chemist. Mr. Fry was formerly associated with American Sugar Refining Company, Bowman Gum, Inc., Bakelite Corporation, E. I. du Pont de Nemours & Company, Inc., and Celanese Corporation.

MEETINGS

Practical subjects on finishing and plating will be featured in symposiums and at a round table discussion during the educational sessions of the **36th ANNUAL CONVENTION** of the **AMERICAN ELECTROPLATERS' SOCIETY.** The convention will be held in Milwaukee, Wisconsin, June 27 to June 30, under the general chairmanship of William C. Geissman of the A. E. S. Milwaukee Branch.

The educational sessions, which are expected to attract a large number of production executives, engineers, techni-

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The MITCHELL-BRADFORD "Package" delivers far more than a range of proven metal finishes, heat treating materials and metal cleaners. It gives you an all-inclusive service for setting up and maintaining the most efficient metal finishing and heat treating operations known to modern chemical engineering.

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Cleaner #7 Still, soak cleaner
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Cleaner #20 Non-etching Aluminum Cleaner
Cleaner #20E Etching-type Aluminum Cleaner
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cians, scientists, and others interested in finishing various metal products, have been planned to give thorough treatment to topics of common interest. Symposiums will be held on "Copper, Nickel, and Chromium Plating," "Plating and Other Treatments of Light Metals," and other subjects. The main topic of the round table discussion will be "Acid Dips in Cleaning Cycles." Reports on selected Research Projects operated by the Society will be included.

Plant visitations in Milwaukee will also be included on the Convention agenda. At Glove Union, Inc., visitors will see the fabrication, finishing, and assembly of roller skates. The Body Division of Nash Kelvinator Company will provide an interesting view of assembly lines for the Nash automobile bodies. Convention registrants will also have an opportunity to visit the X-Ray Division of the General Electric Company.

The **FOURTH ANNUAL SPRING MEETING** of the **INSTRUMENT SOCIETY OF AMERICA** will be held at the Royal York Hotel, Toronto, Canada, May 12 and 13.

The tentative program will include four technical sessions and a dinner on Thursday evening, May 12. The meeting will be of interest to all engineers engaged in measurement, inspection, testing, and automatic control.

THE DETROIT BRANCH of the **A.E.S.** is planning to hold their Second Annual Stag Day at the Forest Lake Country Club near Pontiac, Michigan, on Saturday, July 30, 1949.

Golf will be available for those who wish to play; also horseshoes and softball. A dinner is planned for the evening and door prizes will be awarded. Walter Pinner heads the committee in charge of the Stag Day.

The annual Maypole Party of the **CHICAGO DISTRICT ENAMELERS CLUB** is scheduled for Friday, June 3, at the Gary Country Club, Gary, Indiana. For those members who will not be playing golf, there is also being arranged a visit to the Gary Sheet and Tin Mill of Carnegie-Illinois Steel Corporation. Those members who wish to visit the mill and play golf as well may do both. The mill trip is arranged for 1:30 in the afternoon.

Dinner is scheduled for 6:30 with an outstanding floor show to follow. As has been the custom in the past, both golf prizes and door prizes will be awarded. The Maypole Party is not limited to club members only but all members may bring guests. The club suggests that members make their reservations as early as possible.

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SOCIETIES

D. R. Simmons of the Elberta Crate and Box Co., Bainbridge, Ga., was re-elected president, and L. S. Beale, Chicago, secretary-treasurer, of the **WIREBOUND BOX MANUFACTURERS ASSOCIATION** at the group's annual meeting in New Orleans.

John R. Miller, R. T. Miller Mill Co., Inc., Brewton, Ala., was named vice president, and L. O. Crosby, Jr., Goodyear Yellow Pine Co., Picayune, Miss., was elected a member of the board of directors.

New "rotating members" of the board of directors are S. D. Slaughter and

Better Buffing at Lower Cost

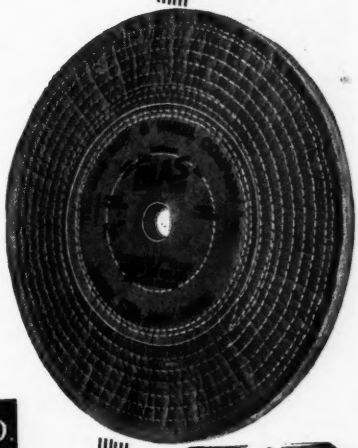
THE BIAS BUFF

Well, with all that's been said—is being said—and is probably going to be said about buffs, it all comes down to "hard-pan"—PUT THE DIFFERENT MAKES OF BUFFS YOU BUY ON YOUR POLISHING MACHINE AND WATCH RESULTS! We welcome just this kind of test!

You will find that our BIAS Buffs save polishing compound, keep work free from ridges, buffs last longer, work easier and faster and cost less in the long run.

The buff shown at right is one of our most popular types. We would like you to give it a good try-out.

THE BIAS BUFF - SPIRALLY SEWED TYPE



For hard cutting down work you can't beat our Spirally Sewed BIAS Buff. It's wonderful for use on heavy parts. Not only fast working, but so easy for the operator—very little pressure required for effective buffing on metal.

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It shows our entire line of BIAS and Conventional Buffs, covering all buffing needs. Please write on your business letterhead. Ask for Catalog "F."

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Riegel

Foster L. Martin. Board members who were re-elected are J. B. Adkins, E. S. Barnhill. S. C. Craven, N. W. Embry, D. R. Gooding, F. J. Martin, Jr., R. F. Miles, A. L. Whiton, D. R. Simmons, and J. R. Miller.

The **6th ANNUAL EDUCATIONAL SESSION** of the **INDIANAPOLIS BRANCH, A. E. S.,** was held Saturday, April 9, at the Indianapolis Athletic Club.

Speakers for the Educational Program were Frank K. Savage, Graham, Crowley & Associates, Inc., who spoke on "Plating Plant Engineering"; J. D. Patrick, Westinghouse Electric Corporation, who spoke on "Applications of PR Copper Plating"; and G. A. Lux, Oakite Products, Inc., who outlined "Some Fundamentals of Alkaline Metal Cleaning."

Both the educational sessions and the banquet which followed were well attended, as may be seen from the accompanying photographs made at the banquet.

Fifteen delegates and three observers from technical organizations concerned with corrosion met at A.S.T.M. headquarters, Philadelphia, Pennsylvania, to formulate the organization of the **INTER-SOCIETY CORROSION COMMITTEE** of **THE NATIONAL ASSOCIATION OF CORROSION ENGINEERS.**

The new committee's objectives were outlined in part during the meeting as follows: (1) to promote cooperation among various technical societies working in the field of corrosion; (2) to prepare and publish periodically a directory of corrosion workers in the United

Three random views of electroplaters and guests at the Indianapolis annual meeting. In the photograph at the left above may be seen G. A. Lux, Oakite Products, Inc., one of the speakers, and in the foreground, Edward Bruck, president of the Indianapolis Branch. In the photograph at the right above may be seen Walter R. Binai, former president and active leader of the Indianapolis Branch, and his guest, Chuan Shaweevongse, Siamese Minister of Education. The lower photograph is a general view of members and guests seated in the I.A.C. ballroom.
(PRODUCTS FINISHING Staff Photos)

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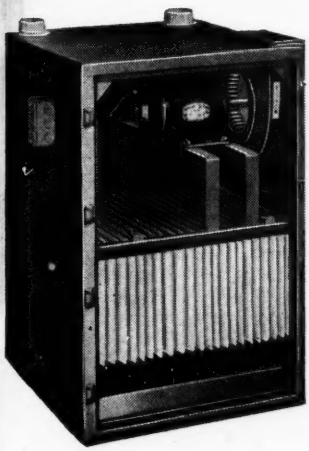
Torit Dust Collectors, by capturing abrasive dusts, prevent damage to precision equipment and finished parts.

TORIT Dust Collectors are self-contained units that trap dust from a wide variety of machines, and recirculate the cleaned air. Compactly designed, they occupy little space and require a minimum of piping.



TORIT Dust Collectors range in size from ⅓ HP to 5HP. They fit all standard polishing, cut-off and grinding machines, and are easily adapted to special equipment or unusual production set-ups.

TORIT Dust Collectors are moderately priced and exceptionally economical to operate. Standard models are available for immediate delivery. For details and the latest TORIT catalog write:

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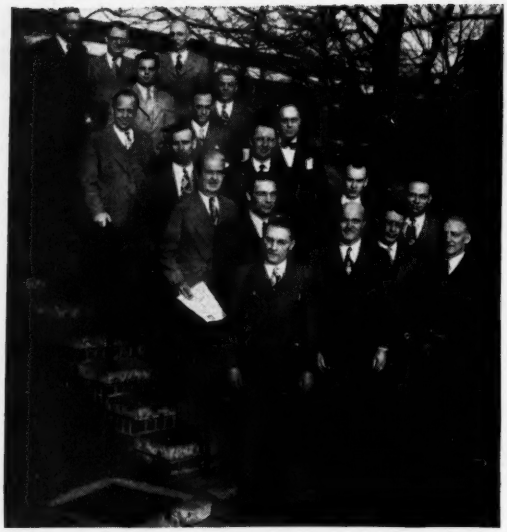

A.I.E.E. Radiant Heating Committee members who recently attended a two-day conference in Philadelphia

States; (3) to provide liason among technical committees of N.A.C.E. and other technical societies; (4) to act in advisory capacity to technical societies interested in corrosion in an effort to promote progress of all and avoid duplication of effort; (5) to recommend in which society a proposed new activity might be carried out best without, however, attempting to define or limit the field of activity of any society; and (6) to stimulate the publication of reliable data on corrosion and to provide publicity for conferences in this field.

The first election held in accordance with the rules of the committee resulted in the choice of Dr. H. H. Uhlig, M. I. T., Cambridge, Mass., chairman; Sam Tour, Sam Tour & Co., Inc., New York City, vice chairman; A. B. Campbell, executive secretary N.A.C.E., secretary ex-officio.

Organizations and their delegates represented on the N.A.C.E. Inter-Society Corrosion Committee include: Alloy Casting Institute, D. W. Talbott and J. W. Juppenlatz; American Gas Association, R. F. Hadley and W. R. Fraser; American Society of Mechanical Engineers, S. Logan Kerr; Electrochemical Society, Dr. H. H. Uhlig and K. G. Compton; National Bureau of Standards, Dr. J. G. Thompson; National District Heating Association, Leo F. Collins; National Research Council, Dr. F. N. Speller and Dr. J. C. Warner; American Society for Testing Materials, Dr. C. D. Hocker and Sam Tour; American Institute of Electrical Engineers, L. J. Gorman and Dr. H. M. Trueblood; Technical Association of the Pulp & Paper Industry, G. F. Pringle and C. G. Russell Johnson; American Chemical Society, Dr. G. H. Young and R. M. Hunter; American Electroplaters' Society, K. M. Huston and Dr. R. M. Wick; American Association for the Advancement of Science, Dr. H. R. Copson and W. S. Loose; Association of American Railroads, G. M. Magee and W. F. Collins; American Society of Heating and Ventilating Engineers, Dr. F. N. Speller; American Society for Metals, Dr. A. E. White; American Water Works Association, H. Lloyd Nelson and Harry E. Jordan; American Foundrymen's Association, Dr. J. T. MacKenzie; American Institute of Chemical Engineers, Dr. R. B. Mears; Federation of Paint and Varnish Production Clubs, Niel T. Phelps and Fred C. Weber, Jr.; and National Association of Corrosion Engineers, Dr. R. B. Mears and F. L. LaQue.

During a recent two-day conference in Philadelphia, members of the **A.I.E.E. RADIANT HEATING COMMITTEE** made inspection trips to Leeds and Northrup Company and the Brown Instrument Division of the Minneapolis-Honeywell Company. New types of electronic instruments were inspected for recording actual product temperatures as used for curing protective coatings, water evaporation, and other requirements.

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Years of research and development have produced this outstanding new BLACOSOLV. This new product has been subjected to the most rigorous stability tests for the most difficult jobs. Contains no alkaline materials which neutralize acid *after* breakdown. The new stabilizers *prevent* solvent breakdown and possible acid formation.

The new BLACOSOLV will degrease scientifically all metals or combinations of metals. You need not pay premium prices for special solvents for different metals. Blacosolv can be used over and over without impairing its high qualities.

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NEW YORK, N.Y. TORONTO, ONT.

The Committee is cooperating with instrument manufacturers in determining requirements and improved methods for controlling heating processes where air temperature and other indirect means cannot be successfully employed.

Members attending the meeting included: Paul H. Goodell, Committee Chairman; C. E. Russell, Secretary; Dr. R. C. Machler; W. H. Wanamaker; Willis F. Hicks; A. H. Canada; C. T. Prendergast; Earl J. Bates; Wm. H. Wagner; J. E. Johanson; Lee P. Hynes; I. J. Barber; J. E. Sump; M. M. Greer; L. W. Cole; C. L. Raynor; Chas. E. Casey; and Dean Lawrence E. Stout, Washington.

TRAINING COURSES

March 4 was graduation day for 22 process control men enrolled in the first 1949 session of the Ferro Training Course, sponsored by the **FERRO ENAMEL CORP.**, Cleveland, Ohio. The students participated in a comprehensive two weeks' program covering all phases of porcelain enamel process control.

The course was under the direction of Dr. Frank J. Zvanut, manager of the Clay Division, who was assisted by Dr. G. H. McIntyre, vice president in charge of research; W. N. Noble, manager of Frit Division; G. L. Bruton, assistant sales manager; E. E. Bryant, director of enamel development; D. R. Goetchius, assistant director of enamel development; B. J. Sweo, director of ceramic research; and Michael Bozsin, manager of process research.

NECROLOGY

RAYMOND N. McADAMS, 65, former secretary of the Hercules Powder Company, died Saturday, April 9, at the Delaware Hospital.

Mr. McAdams joined Hercules at the time of its organization in 1913 as chief clerk of the works accounting division. He was named assistant treasurer of the company in 1926, and secretary in 1941.

DR. WILLARD H. DOW, president of The Dow Chemical Co., Midland, Michigan, died March 31, 1949, in a plane crash near London, Ontario. The recipient of several honorary degrees from scientific and technical societies, Dr. Dow was chosen one of America's 50 foremost business leaders in 1948.

McMILLAN ROBINSON, sales manager for the Metal Products Division of Koppers Company, Inc., Pittsburgh, Pa., died Monday, April 4, in Pennsylvania Hospital, Philadelphia.

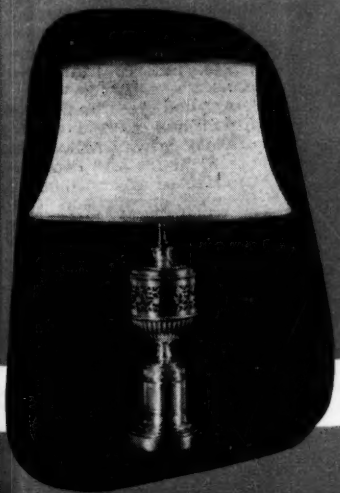
Mr. Robinson joined Koppers last November, after three years as vice president and sales manager of the Ocean City Manufacturing Company of Philadelphia.

Graduates of the first 1949 session of the Ferro Training Course

in appearance and utility

● The 42-inch Kitchenaider cabinet sink has a sink top of acid resisting porcelain enamel on steel. The swing spout faucet is chromium plated. The undersink is of all-steel construction finished in high bake white enamel.

(Photo courtesy Mullins Manufacturing Corp., Warren, Ohio)



● Product of Stadler-Nouwirth, Inc., New York, the lamp illustrated herewith has its base finished in silver plate with a buffed matt finish over which has been applied an Egyptian high bake clear lacquer.

(Photo courtesy Stadler-Nouwirth, Inc., New York 16, N. Y.)

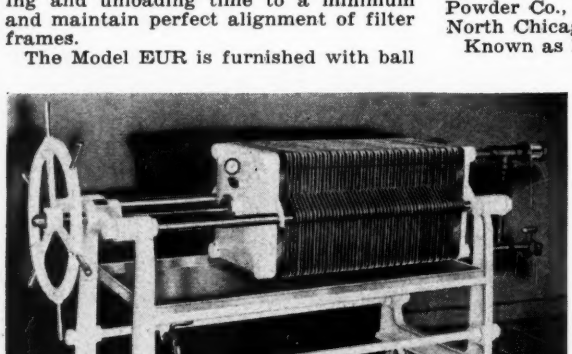
New • EQUIPMENT • MATERIALS • PROCESSES

Ertel Model EUR Hard Rubber Filter

Ertel Model EUR Hard Rubber Filter, a development of the Ertel Engineering Corp., 50 Front St., Kingston 3, N. Y., is designed to provide a complete circulatory passage made of hard rubber and thus prevent contact of liquids with metals.

Features of the filter include elimination of rubber washers (the filter sheets provide the positive seal and the outlet frames are designed to eliminate any breakage of the sheet); and a single handwheel, which is said to reduce loading and unloading time to a minimum and maintain perfect alignment of filter frames.

The Model EUR is furnished with ball bearing type swivel casters but can be obtained with rubber tired wheels. It can also be supplied with the Ertel Model G Plastic Pump, which is of unbreakable plastic and possesses a stainless steel drive shaft.



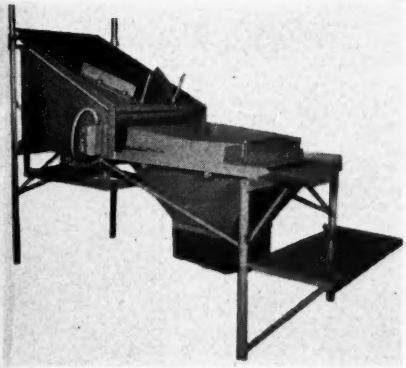
Ertel Model EUR Hard Rubber Filter

Perspiration-Resistant Clear Duranite 115-49

Development of a clear fast-baking finish for metal with unusually high perspiration resistance has been announced by the Industrial Finishes Dept., Atlas Powder Co., Stamford, Connecticut, and North Chicago, Illinois.

Known as Perspiration-Resistant Clear Duranite 115-49, the finish is presently being used by several leading brass fabricators — making lipstick cases, compacts, and fountain pen caps.

Applied to brass, the finish has passed a laboratory perspiration test of 149 hours and remains unaffected after 500 hours in salt spray and 1300 hours in a humidity cabinet. The manufacturer claims that it possesses exceptional hardness and shows no effect after 300 hours in the weatherometer.



Roto-Finish Mechanical Separator

Duranite 115-49 can be applied either by dipping or spraying. The baking cycle is five minutes at 350 deg. F., or equal.

Roto-Finish Mechanical Separator

A new Roto-Finish Mechanical Separator, a motor-driven unit for removing parts from chips or separating mixed chips in the various sizes, is now being manufactured by the Sturgis Products Co., 428 Jacobs St., Sturgis, Michigan.

The separator consists of a welded steel frame with an inclined surface on which is located a hoist pan serving as a hopper, and a waist-high separating table which supports a mechanized shaker screen assembly. The inclined surface for the hoist pan support is adjustable for correct gravity flow onto the screen.

The shaker screen assembly can be elevated from a horizontal to an inclined position with a height of four inches on the end nearest the hoist pan. This height plus the reciprocating motion provided by the motor drive separates parts from chips and automatically discharges the former at the opposite end. The screen assembly is tapered at the discharge end and provided with a vertical lift gate so that parts do not leave the screen before the separation is complete.

The stroke of the screen assembly can be quickly changed by means of a variable adjustment on the motor drive to provide varying amounts of agitation, depending upon the requirements of the separation. The separator is equipped with a detachable tote pan shelf which is easily mounted or removed.

Johnson No. 3 Flat Work Rubbing Machine

Product of the Johnson Engineering & Sales Co., 1139-A Broadway, Rockford, Ill., the Johnson No. 3 Flat Work Rubbing Machine is used for glazing, sanding, and rubbing, and features a fast semi-automatic process for producing high quality finishes on stainless steel or brass sheets, and plastic or composition materials. The machine handles any length sheets from ⅛ to ⅝ inch thick and up to 48 inches wide.

The unit is equipped with flushing attachments and a septic tank in the base, in which is a ½ h.p. motor-driven pump to reclaim the water used when wet sanding is done. Provision is also made for

Johnson No. 3 Flat Work Rubbing Machine

dry sanding, and suction tubes are used to remove dust from sanding operations.

The machine, base, table, and frame, are made of cast iron with sheet steel covers. Overall dimensions are 66¼ inches long x 55¾ inches wide x 72 inches high, and the weight is 4½ tons.

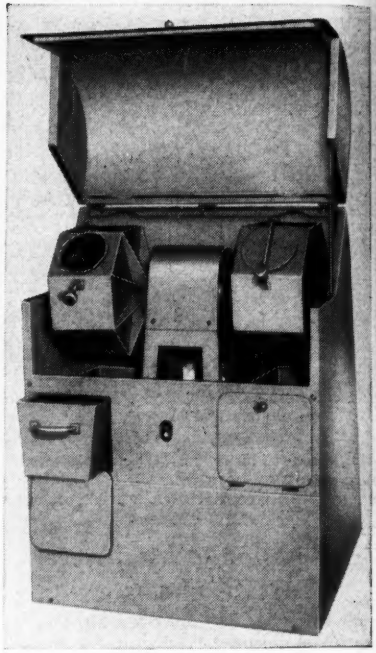
Chem-Peel Strippable Protective Coating

Chemclean Products Corp., 64 Sixth Ave., New York 13, N. Y., has developed a new strippable protective coating for use in metal product manufacturing plants.

This material, called Chem-Peel, is a plastic emulsion that can be applied either by spraying or dipping and imparts to the surfaces so treated a film of plastic which can easily be removed by simply peeling it off. It may be used as a spray booth coating material, as a protective coating for plated or painted products, or as a protective coating for highly finished metal during forming and stamping operations.

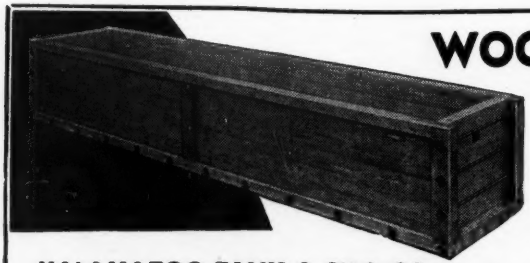
Almco Model DBO-1 Supersheen Tumbling Unit

As an addition to its Supersheen line of precision tumbling barrels, the Almco Division, Queen Stove Works, Inc., Albert Lea, Minn., announces the Almco Model DBO-1 Supersheen Tumbling Unit illustrated herewith, which is particularly designed for the convenient and economical tumbling of small parts and for small production runs. It is also recommended for use in experimental deburring and finishing.



Almco Model DBO-1 Supersheen Tumbling Unit

The Model DBO-1 is equipped with a safety switch, switch box, and ½ h.p. motor (220-440-volt, 60-cycle, 3-phase, 1,750 r.p.m.) Additional features of the unit include speeds from 35 to 70 r.p.m. which can be varied while the machine is in operation; all-welded steel construction with removable unloading drawers with drains and removable screens; and quick-opening and closing water-tight doors.



WOOD TANKS for Plating and Pickling

Excellent Service on all types of wood tanks for any purpose. Built to your specifications by one of America's oldest tank specialists.

Ask for estimates and suggestions.

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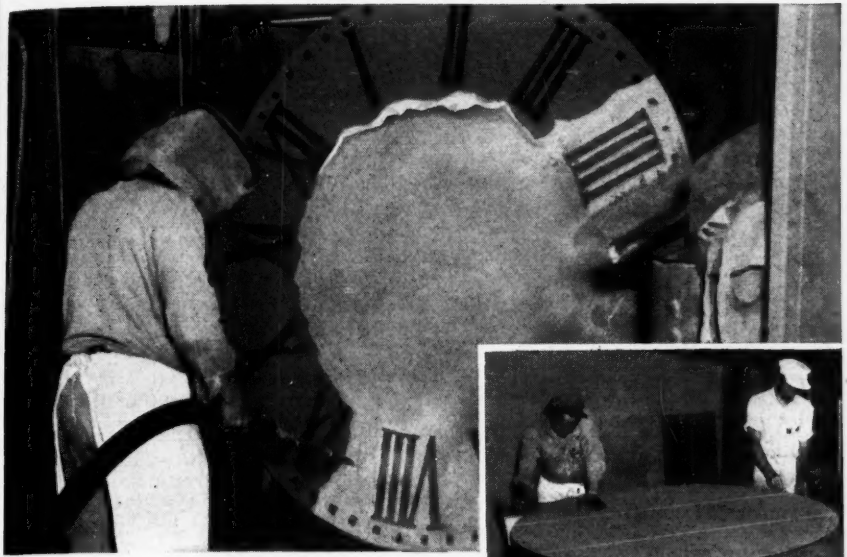

ETCHING GLASS CLOCK DIAL with high-pressure sand-blast at Libbey-Owens-Ford Glass Co. "SCOTCH" Extra Strength Tape No. 280 withstands full force of blast—protects surface not to be etched.

TRIMMING TAPE after application to prepare for designing and sand-blasting.

Paper tape stands sandblast beating

A better job faster and at less cost — that's what "SCOTCH" Extra Strength Tape No. 280 gives this glass manufacturer. The tape goes on at a touch. Pressure-sensitive adhesive clings strongly, yet removes from the job cleanly and quickly.

This is just one of the many jobs "SCOTCH" Pressure-Sensitive Tapes are ready to do. Why not have one of our tape engineers explain how other manufacturers are using these versatile tapes—and how they can save time and money for you?

A letter to us will bring you complete information—or a call from a tape engineer. No obligation. Write Dept. PF-5.

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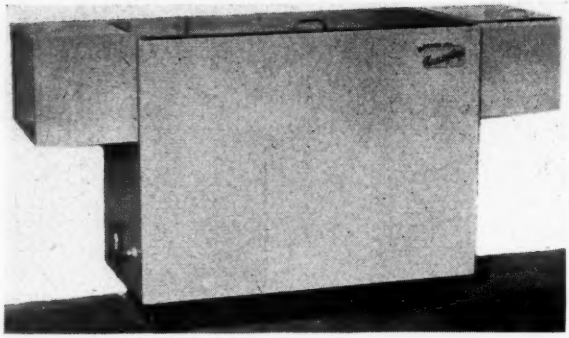
Made in U. S. A. by MINNESOTA MINING & MFG. CO. St. Paul 6, Minn.

General Export: DUREX ABRASIVES CORP., 240 North Ave., New Rochelle, N. Y. • In Canada: CANADIAN DUREX ABRASIVES LTD., Brantford, Ontario



Magnus Krazy Dip Senior

capacities through 48,000 c.f.m., maintains a lower pressure drop with the same cleaning efficiency and water recirculation rate as heretofore and can be operated from 50 to 120 per cent of its normal rating without affecting its collecting efficiency. All sizes are available in either manual cleanout, sludge ejector or hopper bottom arrangement.

Magnus Krazy Dip Senior

Designed for metal-working shops where the volume of parts to be cleaned does not warrant the installation of fully automatic cleaning equipment, the Magnus Krazy Dip Senior, product of the Equipment Div., Magnus Chemical Co., Inc., 208 South Ave., Garwood, N. J., is used for the complete removal of cutting oil and chips, buffing compounds, smut, abrasives, or other deposits resulting from stamping, drawing, cutting, grinding, or other operations. Parts are handled in batches up to 350 pounds.

The unit is air powered and mechanically agitated. There are no heating devices, electric motors, speed reducers, belts, or eccentrics to maintain. An air compressor is the only equipment needed to operate the cleaning machine.

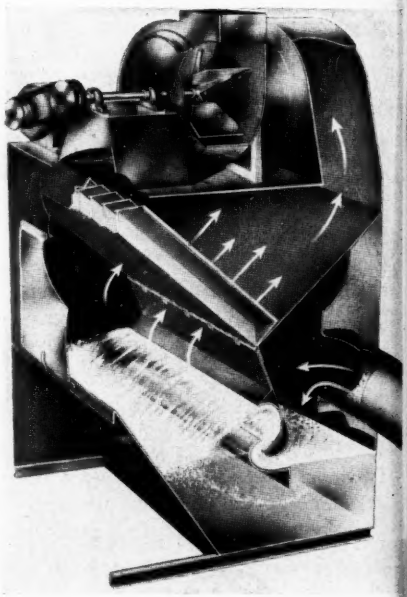
AAF Design 2 Type N "Roto-Clone" Hydrostatic Precipitator

The American Air Filter Co., Inc., 100 Central Ave., Louisville 8, Ky., announces that its AAF Type N "Roto-Clone," used for the collection and control of dust generated in manufacturing and process operations, has been redesigned to provide for wider application and improved performance. Identified as Design 2, the unit is described as a hydrostatic precipitator that cleans the air by the combined action of centrifugal force and a thorough intermixing of water and dust-laden air, reusing the water without recirculation pumps or spray nozzles.

According to the manufacturer, the AAF Design 2 Type N Roto-Clone, with

Mellaphone Type N2400CX Rectifier

Developed as a low-voltage high-amperage source of direct current for electroplating, cleaning, and other industrial processes, the Type N2400CX Rectifier has been announced by the Electronic

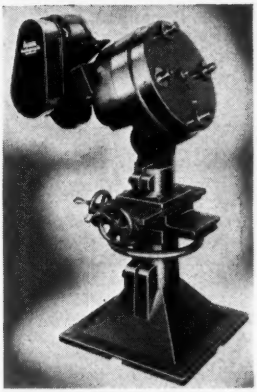


Cutaway View of AAF Design 2 Type N "Roto-Clone" Hydrostatic Precipitator with flat bottom design for manual removal of collected material

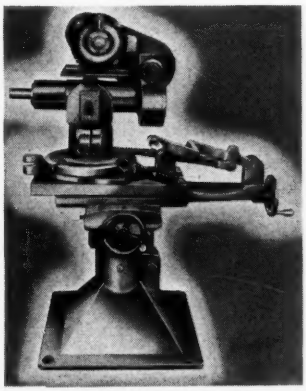
• FOR HIGH PRODUCTION POLISHING AND BUFFING •

ROTARY AUTOMATICS • SEMI-AUTOMATICS • STRAIGHT LINE AUTOMATICS

ACME *Semi-Automatics*



ACME—Type L-4



ACME—Type B-10

. . . are effective cost cutters on Finishing Operations

● Many industrial plants have found that it pays to save high-cost manhours on finishing operations by installing Acme Semi-Automatics. These machines are engineered and built to "deliver the goods," are adaptable to many types of job and have proved their efficiency in production for nearly 50 years.

TOP PHOTO—This four spindle automatic indexing machine has a normal indexing range of from 250 to 700 per hour. It handles parts up to 7 inches diameter and can be used with the conventional lathe or vertical type belt polisher. It can be equipped with ball bearing tail stock work holder to handle parts not suited to usual grip or chucking arrangements.

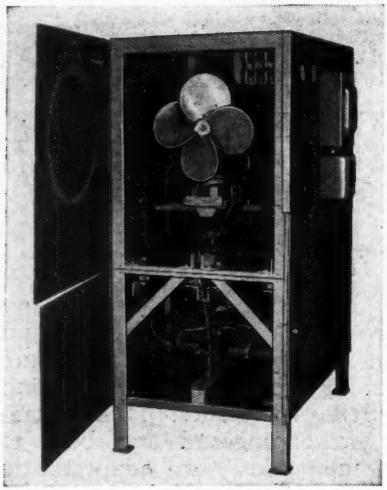
BOTTOM PHOTO — This single spindle machine is used with the conventional lathe for polishing and buffing cylindrical parts such as cooking utensils, electrical fixtures, wheel appearance rims and hub caps, and reflectors. It can be equipped with additional features such as A-2 Head, vacuum chucking and timer control. One operator normally runs two or more of these machines, one at each end of the lathe, and this arrangement usually increases production from 300% to 600% over manual operation.

SPECIAL MACHINERY — AUTOMATIC BUFFING MACHINES

ACME *Manufacturing Co.*

1645 HOWARD ST. DETROIT 16, MICH.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 35 YEARS



Mellaphone Type N2400CX Rectifier

Rectifier Co., Inc., Rochester 2, New York.

According to the manufacturer, the Type N2400CX provides increased plate area per ampere for improved efficiency, longer life, and better voltage regulation. The variable voltage transformer is motor-driven so that the output voltage can be adjusted from remote locations or can be made to respond to automatic controls, it is claimed.

Completely self - contained in one welded steel cabinet, the unit transforms 440-volt 3-phase 50/60 cycle alternating current into 2400-ampere direct current at voltages up to 6 volts. The unit is cooled by forced air and is provided with overload protection by means of a fused safety switch, a magnetic contactor with thermal overload trip mechanism, and fuse protection at essential points.

G-E 81069 Silicone Liquid

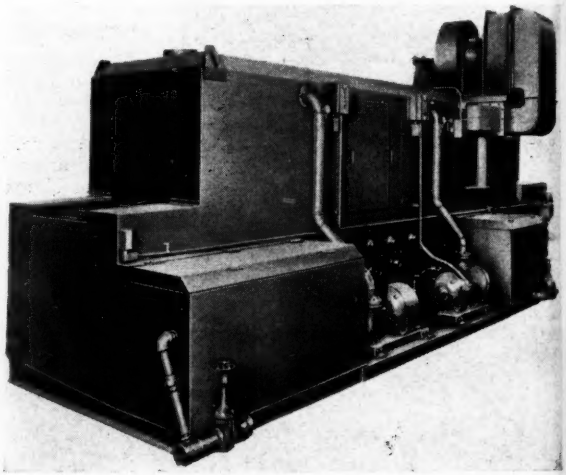
Designated as G-E 81069, a thin colorless silicone liquid for improving the color of paint has been marketed by the General Electric Co., Pittsfield, Massachusetts.

Only one part of the silicone liquid needs to be used in 10,000 parts of certain coating materials to eliminate the separation of pigments and give a more uniform painted surface, the manufacturer states. Because it is most effective when mixed with paint ingredients at the time of manufacture, it is recommended only to paint producers.

Detrex Steam-Heated Zone Washers

A series of washers featuring standardized construction so that multiple wash, rinse, and dry-off stages may be incorporated at minimum cost have been announced by the Detrex Corp., Box 501, Detroit 32, Mich. They have been designed so that if only spray stages are installed orginally, a blow-off stage may be readily added at any time, thus increasing the flexibility of the machines for a variety of production cleaning requirements.

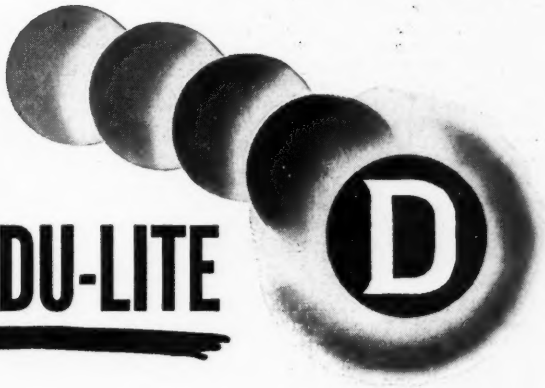
The units, designated as the WB-100-S, single - spray - zone and the WB-200-S, two-spray-zone, may be used as standard metal parts washers for



Detrex Steam-Heated Two-Spray Zone Washer

There are Many Black Finishes

but



only ONE DU-LITE

Many manufacturers have had to learn the "hard" way that Du-Lite is *the* trouble-free, easy-to-operate black finishing process, producing a uniform, intense black finish. Du-Lite is a standard, specified finish for tools, guns, gun parts, photographic, optical, and precision equipment parts where an attractive rust-resistant finish is needed. But that is not its only use . . .

Used By Leading Aircraft Engine Builders As An Aid To Lubrication

Du-Lite is used extensively by engine builders to black finish bearing surfaces before assembly. It might be said, "Why finish these highly polished surfaces?" The reason, and practical too, is that Du-Lite processing rounds off the microscopic spines and edges present on even highly polished surfaces of metal without causing any dimensional change.

Furthermore this Du-Lite black oxide finish is oil-absorptive, rust-resistant, and acts as an aid to lubrication during the breaking-in period, reducing the possibility of galling and scoring.

Investigate Du-Lite for use on your products. Call or write the main office at Middletown and a qualified technical man will call on you.

DO IT RIGHT WITH DU-LITE

Write or Phone Today

The DU-LITE CHEMICAL CORP.

100 RIVER ROAD -:- MIDDLETOWN, CONN.

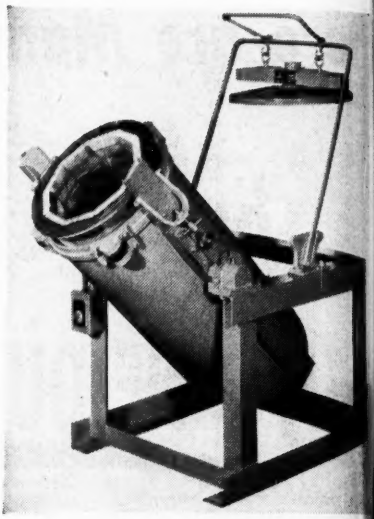
ordinary alkali cleaning compounds, or may be easily converted to efficiently handle compounds which have a tendency to foam excessively, the manufacturer states.

A conveniently located access door is provided for rapid cleanout or adjustment of parts. The blow-off stage, for both the single and double-spray-zone washers, may be steam or gas heated, or built to provide cold air blast, whichever is required. The position of each blow-off nozzle is easily adjustable so that air will strike the work at the angle desired for most effective drying.

H-VW-M Improved Burnishing Barrel

The Hanson-Van Winkle-Munning Co., Matawan, N. J., announces the development of redesigned burnishing barrels of the Mercil type, embodying a number of important improvements.

Both the No. 1 and No. 2 Mercil burnishing barrel units are now being supplied with a reducer type direct-connected drive with motor, eliminating spur gears.



H-VW-M Improved Burnishing Barrel

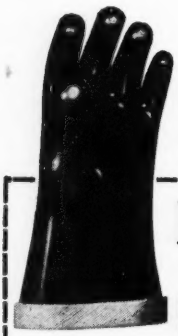
Three roller bearings in a supporti ring have been placed under the barr at the forward end, which aids alig ment and, in addition, serves to distri ute the weight of the load over the enti barrel.

The internal gear is fastened to t bottom of the barrel from the outsid thereby eliminating the necessity of r moving the wood lining blocks when ge or shaft change is necessary. A petcoc is supplied with the cover which can b opened to allow gas to escape.

The metal flange at the top of the ba rel has been increased to strengthen th cover and prevent leaking. The base cas ing is larger and the main shaft has bee increased in size, forming a stronger uni The bottom of the barrel has bee strengthened by increasing the thickness Each burnishing barrel is one integra piece without drilled holes.

The cover gasket is seated on the ste flange instead of on wooden blocks. Th change in flange design provides a bett seal between the barrel and the cove which means additional strength, pre venting deformation of the flange.

The trunnion brackets have bee placed nearer the center of gravity, im proving the loaded balance which per mits greater ease in handling. To elim inate the play that might result fro wear, bronze bushings have been re



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Edmont

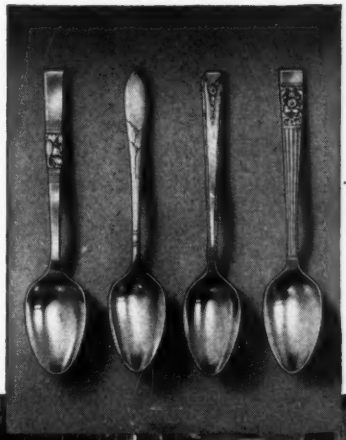
Gloves coated with

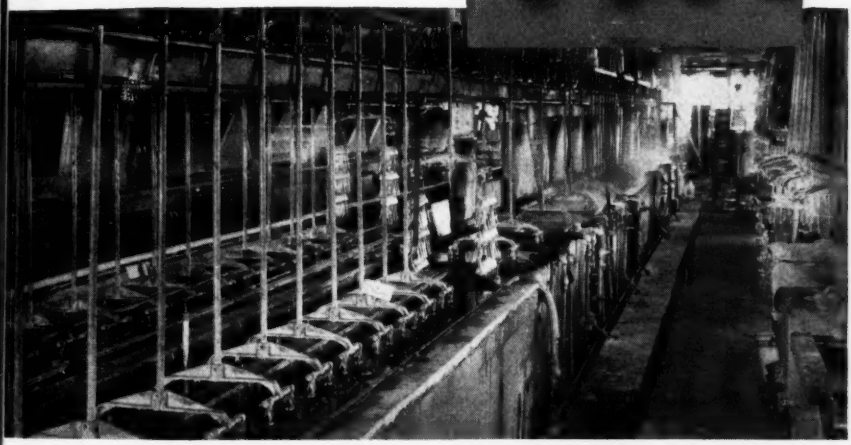
NEOX *plastic rubber*

All Styles Resilient neoprene, now combined with durable plastic, far outwears former Edmonts and has *several times* the life of ordinary gloves. Liquid-proof, snag-proof, with comfortable fabric lining.

TEST OFFER: See your glove supplier or write direct for test samples and prices, stating operation, materials handled, temperature conditions. Edmont Mfg. Co., 509 Orange St., Coshocton, Ohio.

For more than 10 years Oneida Ltd. of *Community* plate fame has consistently used Pennsalt Cleaners





The silverware plants of Oneida Ltd. have used Pennsalt Cleaners for more than a decade in the manufacture of Community, Heirloom Sterling, Tudor Plate and 1881® Rogers® Silverplate. Pennsalt Cleaners have proved successful in the multi-step process of removing buffing compounds prior to silver plating. The task is especially difficult because of the filigree and embossing of intricate and deeply sculptured ornamentation.

other Pennsalt products for metal working industry

Anhydrous Hydrofluoric Acid
Muriatic Acid • Sulfuric Acid • Sal Ammoniac

There are Pennsalt Cleaners for practically every type of metal cleaning. These products are concentrated, highly active, free-rinsing and long lasting. Pennsalt's technically trained representative will gladly make a study of your process to determine how Pennsalt Cleaners can give you better work at less cost. Write to Special Chemicals Division, Pennsylvania Salt Manufacturing Company, Philadelphia 7, Pa.

PENN SALT

metal cleaners

placed by roller bearings. The trunnion shafts are secured to the trunnion block by steel pins reaching all the way through the shaft and bracket.

The internal drive gear is now held in place by cap screws which go through the gear into blind holes in the barrel bottom.

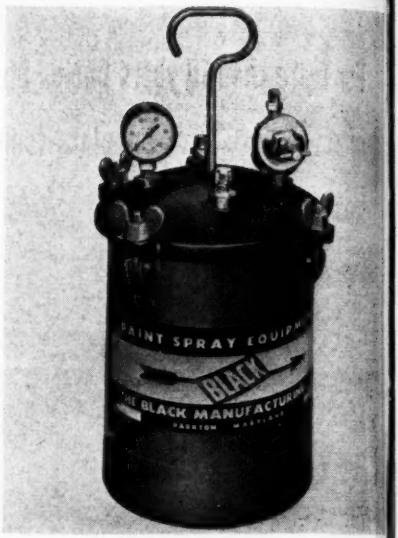
Readily accessible Alemite fittings now replace the old style grease cups.

The BX conduit between the switch box and the motor has been replaced with Neoprene rubber covered cable for increased safety. The flexibility of the Neoprene cable eliminates the possibility of short circuits which might occur with BX cable.

Totally enclosed ball bearing type motors are now used instead of open type sleeve bearing motors.

Black Arrow Small Pressure Tank

The Black Mfg. Co., Baltimore, Md., has added the Model N400 2-Gallon Pressure Tank to its line of Black Arrow paint spray equipment. The unit is galvanized both inside and out, is painted on the outside, and has a concave bottom



Black Arrow Small Pressure Tank

with a reinforcing skirt. The top, which has a working pressure of 50 p.s.i., is made of heavy duty cast iron that is painted to prevent rusting, and is attached to the tank with four high tensile brass swivel bolts.

The Model N400 is equipped with a forged brass regulator, a full size pressure gage, a combination blow-off relief valve, and a brass material cabinet. All fittings are standard pipe thread sizes.

Quaker Formula 100 Cleaner

Quaker Formula 100, a synergized synthetic cleaner for steel, brass, die castings, and aluminum, has been developed by the Quaker Chemical Products Corp., Conshohocken, Pa. With aluminum, the extremely fine grained but superficial etch provided by Formula 100 is said to yield excellent paint adhesion.

The powder type product is used at concentrations of 2 to 3 oz./gal. of water as a tank type cleaner in the temperature range of 180 deg. F. to boiling, and will prepare metal surfaces for phosphating, electroplating, painting, and other operations with immersion times of less than 2 minutes in the cleaning cycle.

CUT DOWN REJECTS
WITH
ORVUS
IN YOUR METAL CLEANING BATHS
You'll find this synthetic detergent effective
—as a wetting agent
—as an emulsifier
—in dispersing lime soaps which might cause poor plating if allowed to deposit on the metal
—in speeding rinsing — minimizing water marks
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PROCTER & GAMBLE • Cincinnati 2, Ohio

How to get better... lower-cost POLISHING

- Look for these 7 features in Polishing grains by CARBORUNDUM to provide better, faster, lower-cost finishing:

1. **UNIFORMITY** of grain size from shipment to shipment.
2. **SOLID GRAINS**—no weak particles, no flats or slivers.
3. Grains with **BUILT-IN SURFACE TENACITY** that results in strong affinity for adhesives.
4. **PERMANENT HIGH CAPILLARITY**, so that adhesives quickly wet the grains—resulting in shorter set-up time.
5. **GRAINS THAT ARE IRREGULAR IN SHAPE**—with numerous sharp, angular surfaces for faster, cleaner cutting.
6. **GRAINS THAT ARE NON-SLIPPING**—that pack beneath the wheel and press firmly into adhesive, giving an open non-shedding coat.
7. **STANDARD GRIT SIZES**—a full range from which to select.

YOU find all these time-saving, money-saving, quality-improving features in both ALOXITE TP aluminum oxide and CARBORUNDUM Silicon Carbide grain and powders.

Abrasive Grain and Finishing Compounds

These abrasives have ideal characteristics for faster set-up and generation of desired surfaces. Grades are produced for cutting down, for coloring, and for combined cutting down and coloring. Moreover, all types of polishing grain are specially treated to remove traces of free iron and other impurities that lead to discoloration.

Your jobber will gladly provide complete data on these polishing materials. If you prefer, write to The Carborundum Company, Niagara Falls, New York.

by CARBORUNDUM

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"Flat-Top" Copper Electroplating Anode

Wagner Brothers, Inc., 432 Midland Ave., Detroit 3, Mich., is now introducing its "Flat-Top" Copper Electroplating Anode. Advantages claimed for the product are its smooth surface, which eliminates gates and flash that often cause hanging on the baskets; complete freedom from cavities and inclusions of copper oxide, silica, and dirt; and 20 to 25 per cent more effective area and more metal per anode, thus reducing loading frequency. Also, this copper anode corrodes more uniformly and as a result prevents rapidly changing anode area with a consequent decrease in sludge formation and rough plating, it is stated.

"Flat-Top" Copper Anode

Tremco Quick Drying Chromated Metal Primer

A recent development by the Tremco Manufacturing Co., 8701 Kinsman Rd., Cleveland, Ohio, is its Quick Drying Chromated Metal Primer, a priming treatment that makes possible the application of two coats of paint over metal in a single day. The priming coat dries to touch in 10 minutes and may be handled in 20 minutes. It can be re-coated in 30 minutes to an hour under average conditions of temperature and humidity (even with coatings containing strong solvents) without lifting or blistering.

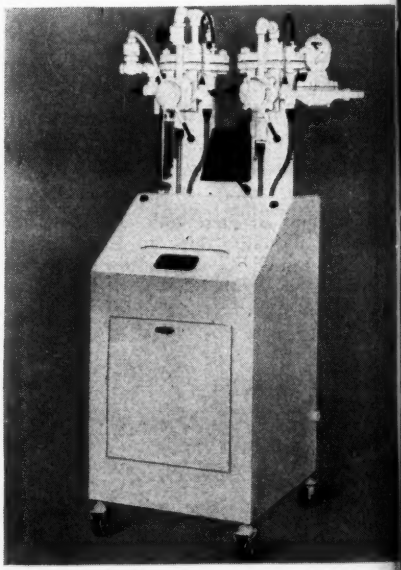
Tremco Quick Drying Chromated Metal Primer and one finish coat are claimed to provide a very durable film over metal surfaces, in addition to full anti-rust protection and maximum paint coat life. In addition to sealing the surface from moisture, it promotes paint adherence.

Available in both red and natural gray and applied by either brush or spray, Tremco Quick Drying Chromated Metal Primer is a Bakelite type of coating which does not require oxidation to dry. Merely by evaporation of the solvents it forms a tough inert film which retains its flexibility. It is said to possess excellent adhesion to light metals as well as to steel and is resistant to salt spray, moisture, and corrosive atmosphere.

Belco Model "200" Package Demineralizing Unit

Belco Industrial Equipment Division, Inc., 102 Iowa Ave., Paterson 3, N. J. announces the development of the Model "200" Package Demineralizing Unit which is said to meet the requirements for high flow rates in a small package unit, having a maximum flow rate of gallons per hour and an exchange capacity of 14,000 grains as calcium carbonate. It is completely self-contained, with regenerant containers concealed in the cabinet. The tanks are rubber-lined and piped with Saran piping and tubing; the operating valves are Everdur.

Completely assembled and loaded ready to be connected to the raw water line, the Model "200" is of steel construction and equipped with ball bearing casters. Electronic controls assure automatic shut-off when a predetermined degree of impurity in the demineralized water is reached.



Belco Model "200" Package Demineralizing Unit

Every Man Doing METAL FINISHING Should Have This FREE BULLETIN

TELLS HOW TO CUT METAL FINISHING COST with MINIT KOTE

• No matter what cleaning system you are now using, it will pay you to "get the facts" about MINIT-KOTE—the *one-stage washer* cleaning system that is cutting metal finishing costs, to the rock bottom, for many of the nation's largest manufacturers of quality metal products.

MINIT-KOTE removes the risk from metal finishing. It provides faster, more thorough cleaning and at the same time protects by forming a light, but uniform phosphate coating on the cleaned surface for better, longer lasting paint adherence —all in one simple, cost cutting operation.

Every man doing metal finishing should know the MINIT-KOTE *cost cutting story*. Bulletin gives all the information—it's yours, free for the asking.

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KLEM *Chemicals Inc.*

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Sil-Brite

Said to be the first brightening agent developed for use with cyanide silver plating solutions since the development of carbon disulfide, a solution of organic compounds designated as Sil-Brite is now available for use as a brightener in silver plating solutions.

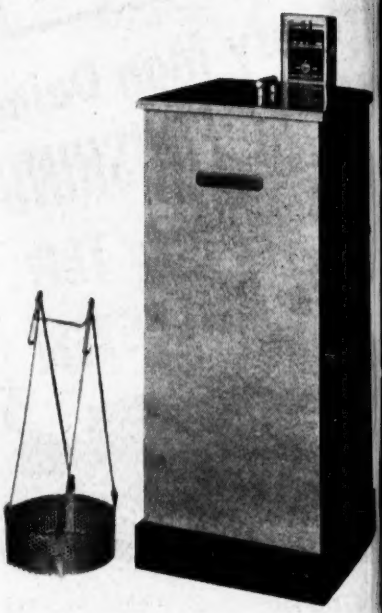
Developed by Electro-Met Research Associates, P. O. Box 634, Cincinnati, Ohio, Sil-Brite is compounded so that an addition of 1 per cent by volume of the brightener to any standard silver plating bath will convert the bath, it is claimed, into a bright plating high speed solution. After the addition has been made, it is claimed that the current density may be raised to as high as 40 to 80 amperes per square foot, and that the deposit will approach a mirror brightness. Buffing is said to be either entirely eliminated or substantially reduced.

The brightener is said to have an exceptionally long life, a broad tolerance to overdosages, and ease of control and operation.

Circo Hot Vapor Automatic Stainless Steel Degreasers

Automatically controlled vapor degreasers for any industry where grease and oil removal from metal are essential to either production or maintenance are now being produced by the Circo Products Co., 12117 Berea Rd., Cleveland 11, Ohio. This equipment is said to clean and dry any metal before and after intermediate processing, especially in industries where plating, painting, or buffing are performed.

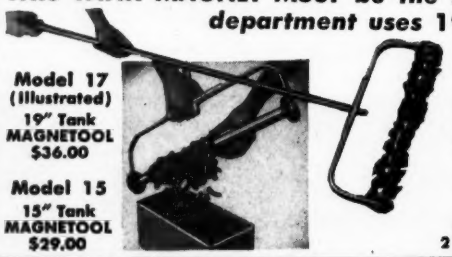
In the Circo unit hot vapor degreasing is automatic and requires no attention during the operation, the manufacturer claims. The solvent is heated, creating clean hot solvent vapor which penetrat greases and oils to the bare metal par being degreased, where it condenses the colder metal, continuing to wa away the soil until the parts have be completely degreased.



Circo "Cub" Degreaser

Circo Degreasers are available in number of standard sizes to meet user requirements. The smallest degreaser the line is the electrically operated aut matically controlled "Cub," which

THIS TANK MAGNET *MUST* be the best! . . . One large plating department uses 19 Rotary Tank MAGNETOOLS



Model 17 (Illustrated)
19" Tank
MAGNETOOL
$36.00

Model 15
15" Tank
MAGNETOOL
$29.00

Plating departments throughout the nation ar rapidly learning the big difference between MAGNETOOL and any other tank magnet MAGNETOOL picks up parts faster—does no grab the tank. Unloads instantly—completely Acid and Alkali proof. NO WIRES. Non-electric Permanent. 100% guaranteed. Entirely new prin ciple—patent pending.
Order direct on 10 day trial or write for Bulletin.

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START with a K-P Belt for a FAST FINISH

Korb-Pettit Spiral Woven Wire Conveyor Belts are fabricated in suitable metals and mesh sizes for baking, conditioning, heat treating, material-handling, processing and washing. Particularly well adapted to conditions where drainage and the free circulation of air are required. K-P Flextrough Belts with flanged edges prevent the escape of small parts. Side chains can be provided for sprocket drive.

K-P Spiral Woven Wire Conveyor Belts increase production and sting the maintenance bill at the same time because they are backed by superior engineering skill and the accumulated experience of many years.

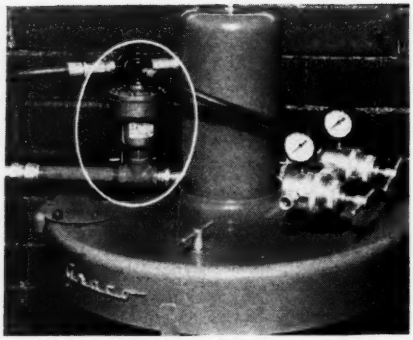
Consult with the K-P district sales office or write direct. Korb-Pettit Wire Fabrics and Iron Works Inc., 1509 North Mascher Street, Philadelphia 22, Pa.

•

Korb-Pettit Spiral Woven Wire Conveyor Belts

"Keeps Promises"

Wire mesh, Spiral Woven Wire Conveyor Belts, Infra-Red Conveyor Dryers, Leather Finishing and Drying Machines, Complete Special Purpose Conveyors designed and Manufactured to Order.



Shelburne "Steadyflow" Surge Eliminator Valve in use

quires a floor space of only 18 x 23 inches and stands approximately 42½ inches high for ease of handling.

Shelburne "Steadyflow" Surge Eliminator Valve

A surge eliminator valve for use with any spray gun which cuts the pump in or out as the gun is used has been announced by the A. Shelburne Co., 739 Ceres Ave., Los Angeles, Calif. Known as the "Steadyflow," the valve is a small, compact unit weighing less than 10 pounds which can be easily attached to any type of air displacement pump. No extra hoses to the gun are necessary.

Used with any material, the valve is claimed to prevent surging, puddling, or gobbing when spraying begins. All straining or separation of materials due to constant high material pressure is also eliminated, and a smooth, even spray is said to be produced immediately.

DuBois Differentiated Klarifiant

Differentiated Klarifiant, a non-foaming water wash spray booth compound designed to control paint overspray effectively and keep booths cleaner for a long period of time, has been developed by The DuBois Co., Cincinnati 3, Ohio.

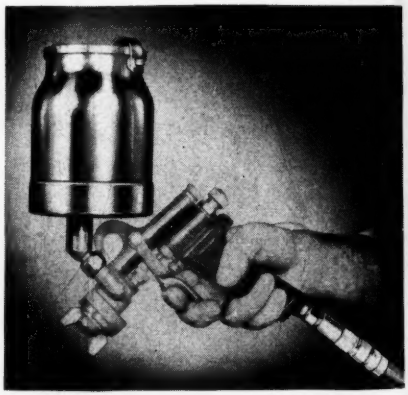
Because of its non-foaming characteristics, higher concentrations can be used, which in turn keeps the hydraulic system of the spray booth absolutely clean, the manufacturer states. Differentiated Klarifiant is recommended particularly for use in the down-draft booths where even the slightest amount of foam is objectionable.

Binks Model 7VF Gravity Feed Spray Gun

Product of the Binks Manufacturing Co., 3122 Carroll Ave., Chicago 12, Ill., the Binks Model 7VF Gravity Feed Spray Gun enables small quantities of fast settling materials to be sprayed without power-driven agitators. Primarily designed to meet laboratory and development needs of the ceramic industry for a gun that can be used in testing new methods and materials on test panels and sample products, it is also adapted for touch-up and patching work.

An adaptation of the standard Binks 7V, the Model 7VF has a material feed inlet on top of the gun head and is fitted with a quart top-mounted gravity feed material cup with snap-on watertight cover. Connection of the material cup to the spray gun is made through a swivel mounting which enables the cup to be adjusted for correct operating balance and performance.

To minimize erosion by abrasive frit, the gun is equipped with harder-than-



Binks Model 7VF Gravity Feed Spray Gun

diamond tungsten carbide inserts in the material nozzle and on the needle tip. Another convenience available with the unit is a quick-detachable air hose con-

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Electric HEATERS

FAST! Easily installed CHROMALOX Electric Heaters give instant heat when and where you want it for processing or production. Temperatures are accurately controlled thermostatically.

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IB-54a

ELECTRIC HEAT FOR MODERN INDUSTRY

nection. A simple twist of the wrist disconnects the gun from the air line and simultaneously shuts off the air; the air comes on when the connection is re-established.

Matawan No. 25W Non-Silicated Metal Cleaner

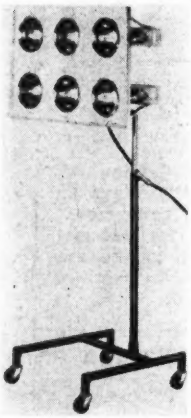
The Hanson-Van Winkle-Munning Co., Matawan, N. J., has developed Matawan No. 25W, a non-silicated soak or electrocleaner especially suitable for applications where the presence of a silicate in the solution would interfere with subsequent processing. Similar to Matawan No. 25, it includes a wetting agent.

Matawan No. 25W may be used as a soak or electrocleaner on steel, copper, brass, lead base castings, or die castings. Reverse electrocleaning may be used on steel to secure smut-free surfaces.

Nalco 6-Light Infra-Red Drying Unit

A 6-light infra-red portable heating and drying unit designed especially for the automotive, electrical, and manufacturing fields has been introduced by the North American Electric Lamp Co., 1020 Tyler St., St. Louis, Missouri.

Mounted on four free-moving casters that assure easy maneuverability and containing six Nalco inside-aluminumed, self-reflecting type lamps, the unit is adjustable in height from 18 inches to 6 feet. It may be tilted to any angle or swung in a vertical or horizontal position for concentrated heating and drying. Two or more of the lamps can be quickly combined to form continuous banks for large area drying when needed.



Nalco 6-Light Infra-Red Drying Unit

The Nalco 6-Light Infra-Red Drying Unit is constructed of rugged tubular steel and is furnished with R-40 type lamps and 20 feet of approved cord and plug.

Udylite "Uzall" Plating Hook

The Udylite Corp., Detroit 11, Mich. has announced its "Uzall" Plating Hook for eliptical anodes, designed to cut anode scraps as much as 50 per cent. This reduction in scrap is said to be possible because the hook allows the entire anode to be completely immersed in the plating solutions. Since it withstands all plating solutions and temperatures, it can be used repeatedly.

The hook is attached to a specially designed cap of neoprene rubber which fits over the top of the elliptical anode. It has rubber shoulder-like projections which protect the center section of the anode where the threads of the hook fasten into the anode proper. Where the hook is turned tightly into the anode, the pressure of the hook against the cap seals the anode top to the hook and does not permit plating solutions to seep into the section where the hook threads enter the anode.

Fig. 1—Udylite "Uzall" Plating Hook being attached to new anode

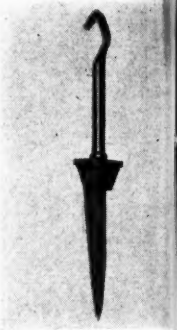


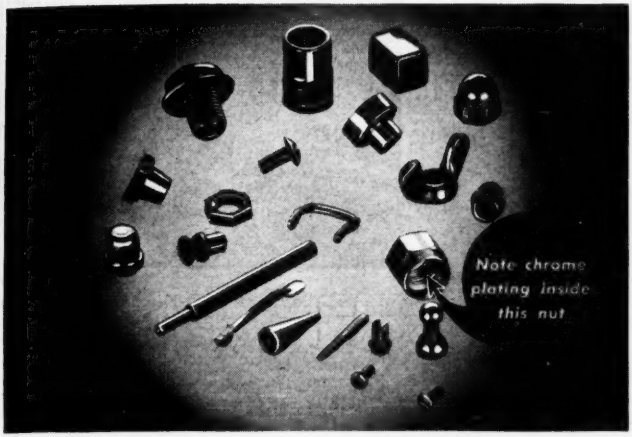
Fig. 2—"Uzall" Plating Hook firmly attached to anode which has been largely consumed

The Uzall Plating Hook is available in 6 and 8-inch lengths, and fits all anode rods up to and including 1½ inches in diameter.

Red-Skin Strippable Spray Booth Coating

A non-inflammable liquid coating supplied at spraying or brushing consistency has been developed by the Dennis Chemical Co., 2701 Papin St., St. Louis 3, Mo. Designated as No. 2730 Red-Skin, the

MECHROME process plated



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	LOS ANGELES, CALIF.	

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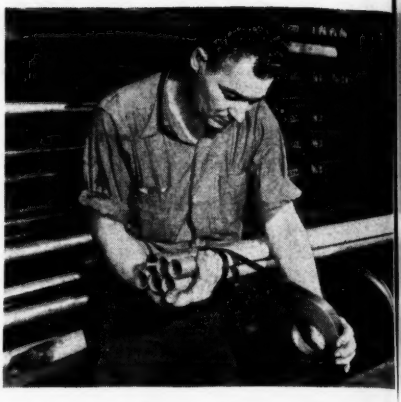
spray booth coating can be applied to spray booth walls by brushing or spraying and is said to form a tough, resilient, chemically-resistant film almost immediately as a result of evaporation of solvent.

When it is necessary to clean the spray booth, the Red-Skin Coating is said to be easily stripped off in one continuous sheet, carrying with it all accumulated overspray paint and leaving the spray booth walls clean and ready for recoating.

"Scotch" Brand No. 880 Filament Tape

A second "Scotch" brand filament tape for heavy duty packaging has been made available by the Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Designed with an acetate film backing instead of paper, the tape is waterproof, and is thinner than the paper-backed filament tape, thus making it easy to handle and enabling packages banded with it to slide freely.

Scotch Brand No. 880 Filament Tape needs no application equipment, the manufacturer states. It is designed for packaging metal pipes, rods, sheets, and coils by being wrapped once around the load and back on itself. Its pressure-sensitive adhesive is said to grip immediately on contact.



"Scotch" Brand No. 880 Filament Tape being used to fasten pipe for bulk handling

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McKeon's Zinc-Brite

Improved Blacosolv Degreasing Solvent

G. S. Blakeslee & Co., Dept. 6, Chicago 50, Ill., has announced an improved stabilized degreasing solvent designated as Blacosolv. According to the manufacturer, the improvement has been made by changing the stabilizers used so that the solvent breakdown and acid formation are prevented. Stabilizers used are claimed to be present at all times in both the liquid and vapor phases of the solvent.

An advantage of the Improved Blacosolv is stated to be the fact that the stabilizers do not react chemically with fatty acids and other products present in oils, greases, buffing compounds, and so on. Therefore, frequent tests of solvent purity need not be made.

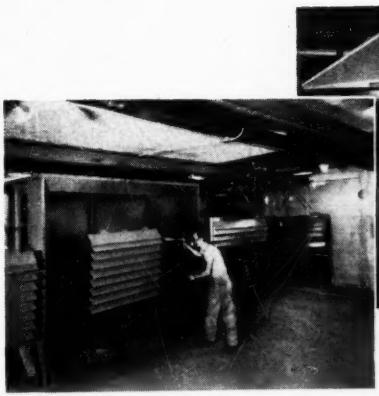
Sterling 1000 Portable Electric Sander

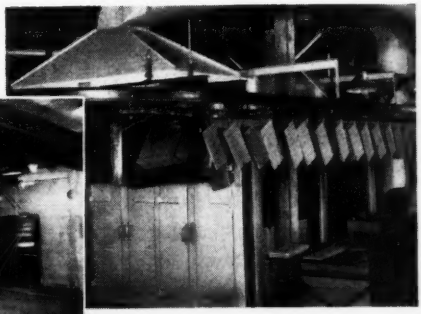
The Sterling Tool Products Co., 1340 N. Milwaukee Ave., Chicago 22, Ill., is now marketing the Sterling 1000 Portable Electric Sander, which utilizes a special flexible sponge rubber pad attachment

From Start to Finish

YOUNG & BERTKE

FINISHING SYSTEMS





Whatever your requirements in a finishing system, spray booths, laboratory ovens, conveyor type ovens, etc., Young & Bertke can plan an efficient finishing system for you that will best fit your individual needs. Call on us now, our engineer will be glad to consult with you on your finishing problems.

Ovens — Spray Booths — Complete Finishing Systems

The YOUNG BERTKE Co.

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for finishing even, extremely curved surfaces. The sanding pad moves in a $\frac{3}{16}$-inch orbit at a speed of 5,000 cycles per minute, and is claimed to speed up finishing operations 300 per cent over hand methods, as well as deliver more uniform sanding results.

One advantage of the Sterling 1000 Portable Electric Sander is its use of standard 9 x 11-inch sandpaper sheets which divide exactly into three pieces to fit the pad, and one-hand operation, thus relieving operator fatigue and permitting use of the tool in hard-to-reach places, it it stated.

Production sanding speed is increased through the use of pre-loaded pads. In addition to the standard sanding pad and the special sponge rubber pad for curved surface sanding, a rubbing pad is also available for use with free abrasives, rubbing compounds, and so on.

Chromalox Type ARTM Thermostatically-Controlled Immersion Heater

A new series of Chromalox screw-in type electric water heater units with built-in thermostatic control has been announced by the Edwin L. Wiegand Co. 7552 Thomas Blvd., Pittsburgh 8, Pa. Designated as the Type ARTM, the heaters are designed for conversion of standard fuel-fired hot water tanks to electricity, and are especially applicable for commercial and industrial purposes which require limited amounts of convenient hot water.

Chromalox Type ARTM Thermostatically-Controlled Immersion Heater

The heating element is a Chromalox copper-sheathed enclosed type tubular heater brazed into a 1-inch red brass screw plug with a sealed brass well for the sensitive thermostat bulb. The thermostat, complete with removable housing, is mounted directly on the screw plug, and may be set to control water temperature between 100 and 170 deg. F. The well is located so as to be in contact with the element for protection if the water level should drop below the element.

The Type ARTM is available for 110 or 236-volt service and wattages of 750, 1000, 1250, and 1500, and may be used singly or doubly in tanks up to 80-gallon capacity.

CORRECTION

The announcement concerning the Ransomatic Washing Machine printed on Pages 120 and 121 of the April issue indicated that the drum of the machine could be supplied in copper-lined steel. The drum is not supplied in copper-lined steel, as the announcement stated, but in rubber-lined steel.

PRODUCT LITERATURE

The publications listed in this section may be obtained free upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning PRODUCTS FINISHING when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

Oakite Special Report 6705, available from Oakite Products, Inc., 20 Thames St., New York 6, N. Y., discusses its Composition No. 3 for burnishing steel, brass, aluminum, zinc die castings, and silver. Complete data on cleaning and bright dipping before burnishing and the best methods of maintaining balls and barrels in good condition are included.

Switch to JEWEL ABRASIVES for lower-cost finishing!

AP ENGINEERS recommended Silver Streak Belts for phenol plastic switch plates. Silver Streaks cost no more than previously used belts, did 25% more work, and eliminated spoilage.

FOR TRICKY COMBINATIONS of wood and metal, a prominent golf club manufacturer has found that nothing equals heat-resisting Bondite New Process Belts. Like all Jewel Belts, they have AP's exclusive Velvet Joint that will not jump or bump.

REMEMBER—there's a Jewel product for every sanding, polishing and grinding need.

Abrasive Products, Inc.

ABRASIVE PRODUCTS INC. JEWEL ABRASIVES SOUTH BRAINTREE, MASS. U.S.A.

There's a JEWEL ABRASIVE for Every Polishing and Finishing Need

BELTS
DISKS
SHEETS
SPECIAL SHAPES
Cloth, Paper, Fibre or Combination Backing

BUY THROUGH YOUR INDUSTRIAL DISTRIBUTOR

"Production" Backstands for converting polishing and buffing lathes to the abrasive belt system are illustrated and described as to features and specifications in **Bulletin PF-11**, now available from Production Machine Co., Greenfield, Massachusetts.

M & W Finishing Materials for the Casket Industry. A color card, designed with punch holes for easy insertion in a loose-leaf binder, has been specially prepared by the Mass & Waldstein Co., Newark 4, N. J., for the casket industry. Made up of 16 colorful metallic shades, the color card also includes information pertaining to casket primers, putties, and topcoats, as well as special lacquers for casket hardware.

Bullard Automatic Station-Type Conveyors for plating, cleaning, descaling, bright dipping, blackening, anodizing, and so on, are described in detail in **Bulletin BD45**, available from The Bullard Co., Bullard-Dunn Process Div., Bridgeport 2, Connecticut.

Washer Folder. The Ransohoff "Ransomatic" for the automatic washing, pickling, and neutralizing of metal parts prior to plating is illustrated and described in a four-page folder issued by N. Ransohoff, Inc., 9 East 72nd St., Cincinnati 16, Ohio.

Hammond Rotary Automatics for polishing, buffing, brushing, and deburring are shown and described in **Catalog No. 415** released by the Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo 54, Michigan.

Quick Tests for Identifying Eight White Metals and Alloys. An outline published by The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y., explains how nickel and the different high-nickel alloys can be distinguished from other white metals by a standard set of quick and simple qualitative tests.

Corrosion Resistant Materials and Equipment. As an aid in helping those interested in corrosion resistant materials and equipment to quickly determine the wide range of products manufactured by the company, The U. S. Stoneware Co., Akron 9, Ohio, has prepared Bulletin "L," which presents illustrated and descritive information on acid brick, acid pumps, Acikote, chemical porcelain, chemical stoneware, conical blenders, corrosion-resistant cements, drum rollers and tumblers, Duralon, gasketing, jar mills, laboratory equipment, lead, pipe and fittings, pots and jars, protective coatings, raschig rings, Resilon, rubber, suction filters, tank linings, tower packing, tubing, Tygoflex, Tygon, and valves.

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Guaranteed 100% Pure Gold Content
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Bristol Industry Data Bulletin No. 13 The Bristol Co., 108 Bristol Rd., Waterbury 91, Conn., has available a 10-page bulletin which discusses the application of pH recording and controlling instruments and rate-of-flow recording and integrating instruments to industrial waste disposal operations. Photographs of the instruments and diagrams of several typical waste disposal applications are included.

Simonds Mounted Wheels and Points The versatility of mounted wheels and points for offhand and precision work and for grinding in hard-to-reach places is described in Folder ESA-67, offered by the Simonds Abrasive Co., Tacony & Fraley Sts., Philadelphia 37, Pa. Included are full-size illustrations of these products together with suggested uses and a graphic presentation of the wide range of sizes available, as well as information on grains, grades, operating speeds, and a section giving four easily-followed rules for ordering the desired wheels and points.

Presto Polishing Room Accessories Bulletin 103. Available from The Manderscheid Co., 810 Fulton St., Chicago 7, Ill., is an eight-page bulletin illustrating and describing the Presto line of work holding spinners, spinner ceiling supports, polishing wheel balance ways, tube polishing machines, tube support stands, work supporting roller, scratch brush lathe, cast iron emery troughs, modern wheel rakes, lathe collars and wrenches, nuts and flanges, polishing wheel bushings, balance weights, screw points and end chucks, buff chucks and end plate chucks.

Industrial Heating Bulletins. Dealing with the major heating applications commonly encountered in manufacturing processes and designed to show how electric heat when properly applied can help industry to increase production, provide better equipment designs, and improve product quality, the General Electric Co., Schenectady 5, N. Y., has available the following three application data booklets: "Melting Soft Metals with Electric Heaters" (GET-1740); "Heating Process Air with Electric Heaters" (GET-1741); and "Heating Liquids with Electric Heaters" (GET-1742).

Udylite Bright Nickel Plating Process and its advantages are the subject of Bulletin 51, distributed by The Udylite Corp., Detroit 11, Michigan.

Tall Oil Bulletin No. 7. In this bulletin National Southern Products Corp., 630 Fifth Ave., New York 20, N. Y., presents a bibliography and abstract of all published literature, including patent information, on the usage of tall oil in the paint, varnish, lacquer, and other industries.

"The Handling of Webs and Monofilaments." Written by C. A. Litzler, president, Industrial Ovens, Inc., 13825 Triskett Rd., Cleveland 11, Ohio, this 20-page booklet, a reprint of a paper originally presented before the convention of the American Society of Tool Engineers, is a liberally illustrated study of some primary considerations with respect to entire handling operations involving flexible and continuous strand or web materials, such as wire, monofilaments, cords, tapes, tubings, paper, textiles, and films.

Materials of Chemical Construction. Available from the Atlas Mineral Products Company of Pa., Mertztown, Pa., is a 16-page bulletin which illustrates and describes acid-proof cements, plastic linings, jointing materials, and protective coatings.

Blacosolv Leaflet. A leaflet outlining the details of an improved Blacosolv Degeasing Solvent in which has been incorporated new and improved stabilizers is available from G. S. Blakeslee & Co., Dept. 6, Chicago 50, Illinois.

Full Automatic Electroplating Conveyors are thoroughly discussed and illustrated in **Bulletin No. FA-103,** available from the Hanson-Van Winkle-Munning Co., Matawan, N. J. Topics covered include: elevator type conveyors, the Munning type, straight line type special plating machines, caustic cleaning lines, tin plating lines, wire and cable plating, and typical assembly of Munning and elevator type full automatic plating conveyors.

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cleans spray booths quickly, economically, safely!

Spray Boothcote on clean booth. Surplus paint can then be peeled off in sheets by any operator.

- Saves time and labor
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- Mixed—ready to use

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- Does not flake off

Money back trial offer: 15 gals. $16.50 f.o.b. Buffalo or write for Circular.

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CLEAN ALUMINUM

HOW?

Aluminite will remove buffing compounds without scratching or tarnishing. This increases the final sheen which pays-off in increased consumer acceptance. Further facts on request.

Stuart INDUSTRIAL SERVICE, INC.

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Bulletin AC-105, published by the Hanson-Van Winkle-Munning Co., Matawan, N. J., describes the company's complete line of anodes and plating chemicals.

Naz-Dar Silk Screen Colors, Supplies, and Equipment are listed and illustrated in **Catalog No. 25,** which can be obtained from the Naz-Dar Co., Dept. PF 4-49, 469-483 Milwaukee Ave., Chicago 10, Ill.

Backstand Catalog. Its complete line of nine bench and floor type backstands with automatic air belt tensioning is presented in a catalog by the Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo 54, Mich. Specifications of each unit and recommendations for use are given.

Atlas Zerok Coating, an acid and alkali-proof protective coating for concrete and steel structural materials and equipment, is described as to chemical properties, uses, application, and maintenance in a six-page two-color bulletin published by the Atlas Mineral Products Company of Pa., Mertztown, Pennsylvania.

Optimus Bulletin No. 91. The Optimus Equipment Co., 115 Water St., Matawan, N. J., has available Bulletin No. 91 which describes its line of flat conveyor and continuous types "power spray" washers, screw-drum type washers (wash, rinse, dry), "Spotless" metal parts, driers, vapor degreasers (bath and conveyorized types), and "power spray" washers for small parts on racks or in baskets.

TEST YOUR PRODUCTS ! !

Testing Equipment for Organic Coatings

ASTM Viscosity Cups, Conical Mandrel ASTM D522-41, Abrasiometer ASTM D658-44, Scratch Adhesion & Mar Tester (Laboratory & Pocket type). Automatic Spraying Machine D825-45T, Bell Tele. Lab. Impact Tester, Dust Free Tester (drying time).

Write for illustrated literature.

HENRY ZUHR, INC.

187 Lafayette St., N.Y.C., 13

Bristol Stock Instruments. Bulletin W1811, available from The Bristol Co., 108 Bristol Rd., Waterbury 91, Conn., illustrates and lists specifications and applications of many stock laboratory instruments.

"Reducing Spray Booth Maintenance Costs" is the subject of two bulletins on the Acme Water Wash Spray Booth, published by George Koch Sons, Inc., P. O. Box 358, Evansville 4, Ind. These bulletins, Nos. 300E and 301E, describe in detail and illustrate the advantages of Acme booths. Also included is a complete specifications chart for five standard sizes of cross-draft booths.

Chain-O-Flex, a flexible chain conveyor packaged product for use where a constant flow of material or assembled products is essential, is the subject of **Circular COF-149** available from Chain-O-Flex Corp., Franklin Park, Illinois. Dimensions, assembly instructions, and operating data, together with illustrations, are included in the eight-page circular.

Bulletin 119, describing and illustrating the Barnstead Purity Meter for making quick check-tests for purity of distilled or demineralized water, has been released by the Barnstead Still & Sterilizer Co., 2 Lanesville Terrace, Forest Hills, Boston 31, Mass. Specifications of the unit, operating instructions, and features, plus descriptions of several accessories, are included in the bulletin.

L&N Bulletin ND44-96-708. To show how numerous steel mills, metal working shops, oil refineries, chemical works, and other plants are effectively combating stream pollution through the use of standard pH equipment which automatically controls the neutralization of waste, the Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa., has published a 20-page, fully illustrated bulletin entitled "For Effective Neutralization of Industrial Wastes—Micromax Automatic pH Control." Illustrations show actual Micromax pH Control installations and pH control records being obtained by users.

Features and advantages of the M.S.A. DeLuxe Faceshield for protecting against heat, flying particles, and acid splashes are shown and discussed in **Bulletin No. CN-2** available from the Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pennsylvania.

Performance data, construction and operation, specifications and prices of the Murphy "Paragon C" Compressed Air Separator, designed to remove all traces of oil, moisture, and dirt from compressed air at the point of use, are presented in **Bulletin P,** available from James A. Murphy & Co., Fifth & Vine Sts., Hamilton, Ohio.

Filter Bulletin. Features of the Staynew Model A-3 4-Stage Automatic Filter, suggested applications, operating characteristics, as well as capacity and dimension tables, performance data, and cutaway views, are included an an eight-page bulletin released by the Dollinger Corp., 11 Center Pk., Rochester 3, New York.

Cleaning and Pickling Data Sheet. "Nielite" C Cleaning and Pickling Acid for ferrous metals is the subject of a technical data sheet now being distributed by Nielco Laboratories, Detroit 19, Michigan. The product is described as a mixture of phosphoric acid, acid salts, surface active agents, and inhibitors.

Bulletin No 250, describing the one-piece unbreakable self-aligning Arco rubber insulated anode rod support, is available from the Automotive Rubber Co., Inc., 8601 Epworth Blvd., Detroit 4, Michigan.

Flexaust Lightweight Flexible Hose. The American Ventilating Hose Co., 15 Park Row, New York 7, N. Y., has published Catalog No. 30 which describes its lightweight flexible hose designed specifically for dust collection, fume control, and ventilation. Typical applications, installation data, accessories, and general information and engineering data are included in the 12-page catalog.

FOR SAFETY AND SPEED . . . JUST STRIP!

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Red-Skin Brand Strippable

SPRAY BOOTH COATING

Tough film, pigmented white for light reflection. Easily strips off in continuous sheet, carrying accumulated overspray on film. Time and labor-saving. Can be sprayed or brushed.

Trial Offer—5 Gallons $13.75 F.O.B. St. Louis, or write for sample panels.

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Cutting, Cut and Color, and Mirror-Finishing Compounds

on

Aluminum, Brass, Copper, Stainless Steel, Carbon Steel, Etc.

Try Our New Grease Stick.

Samples are yours for the asking.

HARRISON & COMPANY, INC.

Haverhill, Massachusetts

The Standard Electrical Tool Co., 2518 River Rd., Cincinnati 4, Ohio, announces **Bulletin 70,** which covers its line of bench and floor abrasive belt machinery with horizontal backstands, flexible horizontal-vertical backstands, individual wheel heads, various sizes of spring loaded and air cylinder backstands using from 6 to 20-inch diameter contact wheels, along with a variety of heavy duty polishers and grinders with work rests as required for heavy grinding and snagging with abrasive belts.

Catalog "F," showing the entire line of Bias and conventional buffs, is available from The Bias Buff and Wheel Co., 3464-3466 Hudson Blvd., Jersey City 7, New Jersey.

"Rulon Industrial Floorings and Acid-proof Construction" is the subject of an eight-page folder published by Ralph V. Rulon, Inc., 3900 N. Second St., Philadelphia 40, Pa. Specifications, operating characteristics, and features of each product are listed, and installations pictured through photographs and drawings.

Magnus Bulletin 502-KR, completely describing the Krazy Dip Senior Cold Parts Cleaning Machine for use in metal working plants for the removal of cutting oil and chips, buffing compounds, smut, abrasives, or other deposits resulting from stamping, drawing, cutting, grinding, or other operations, can be obtained from the Magnus Chemical Co., Inc., Equipment Div., 208 South Ave., Garwood, New Jersey.

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Company
Save money on your degreasing solvents by having BERKS REFINING COMPANY rerefine your used solvents. No shipping problem for you. We pick up your used solvents and return them to you. Ask for price and save money.
Write P. O. Box 52, Pottstown, Pa.
Phone: Birdsboro 2-2956.

Batch cleaning in portable metal washing machines for production, maintenance, and repair is the subject of **Bulletin 4E2,** published by the Optimus Equipment Co., 15 Water St., Matawan, N. J., which discusses both the dip-agitating and spray types, their advantages and applications.

The Tennessee Eastman Corp., Kingsport, Tenn., has issued a revised edition of its book, **Eastman Cellulose Esters,** which contains the latest data on specifications and characteristics of the standard types of Eastman Cellulose Esters—cellulose acetate, cellulose triacetate, and cellulose acetate butyrate—together with information on their uses with solvents, plasticizers, and resins. This 38-page spirally-bound book is amply illustrated with tables and graphs.

Catalog No. 61, which lists the company's complete line of polishing, buffing, and burring compounds and polishing wheel cements, is available from the Formax Manufacturing Co., 3171 Bellevue, Detroit 7, Mich. Recommendations for best use of each product are included in the catalog.

Crown Travel and Transfer Conveyors. Crown Unit-Matic equipment, its uses, construction, and applications, are the subject of a 48-page spiral-bound catalog, released by the Crown Rheostat & Supply Co., 3465 N. Kimball St., Chicago 16, Ill. The catalog presents several plans, pictures, and cycles that are offered by Crown to show how the Unit-Matic could be applied in the plating industry.

Roto-Clone Bulletin. AAF Design 2 Type N "Roto-Clone" Hydrostatic Precipitator, intended for the collection and control of dust generated in manufacturing and process operations, is fully illustrated and described as to advantages, available arrangements, features, performance characteristics, and so on, in a 20-page bulletin issued by the American Air Filter Co., Inc., 100 Central Ave., Louisville 8, Ky. Copy of Bulletin No. 277-A free upon request.

The Finishing Touch

By J. A. Patterson

"He wouldn't just quit—I had to fire him!"

Opportunity Section

Established Wisconsin manufacturer's representative and distributor seeking additional top-grade line. Five salesmen covering spraying, plating, and polishing trade. Now representing top national accounts. Write fully to Box 51, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

FOR SALE: 2,500 Safety Needle Point Tampico wheels. Never used, excellent for satinizing work on metal. 12" diameter, 1¼" hole, 20% off present market price. Ford Metal Moulding Co., 27-01 Bridge Plaza N., Long Island City, N. Y.

SURPLUS FOR SALE

Unit consisting of three (3) Gardner Machine Company 3 DB double spindle ball bearing polishing lathes—57" between wheels, 2 mountings—V belt motor drive, variable speed 1750-3000 RPM with six (6) Master Elec. Company 5 HP encl. fan cooled DC motors and one (1) Reliance Elec. & Eng. Company 2 unit 3 bearing motor generator set 40 KW ball bearing shunt wound DC generator.

Two (2) Schauer Machine Company NA2B floor type electric speed lathes. 1 HP-3 phase-60 cy-1725-3450 RPM hand operated motor and brake with 7½" 3 jaw Universal Chuck—2 sets of jaws and adapters.

One (1) Standard Elec. Tool Company polishing lathe, 2 ORSBY 20 HP speed 2400 RPM.

One (1) Acme B10 Automatic polishing and buffing machine.

ARGUS MANUFACTURING COMPANY
1134-44 N. Kilbourn Ave., Chicago 51, Ill.

FOR SALE: One Meaker Semi-Automatic with tank 21 ft. x 42" x 42", complete with motor. Good condition. $900.00. Triplex Plating, Inc., Corydon Road, Michigan City, Indiana.

Infra-Red Surplus

256 K.W. installation—wired for 220 volts, 3 phase. 20 banks in following sizes:

4 banks — 63" x 86"
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NEW BOOKS

1949 Directory of Occupational Safety Posters. Prepared by the National Safety Council, 20 N. Wacker Dr., Chicago 6, Ill. Price, 50 cents.

This 72-page directory contains 744 illustrations of two, three, and four-color posters, classified under 15 sections. Included is a convenient index that quickly locates posters on specific accident hazards. Posters range in size from 8½ x 11½ inches to 10 x 12 feet.

Coding of Thermocouple Wire and Extension Wire—Tentative Recommended Practice RP1.1. Published by the Instrument Society of America, 1117 Wolfendale St., Pittsburgh 12, Pa. 4 pages, 8½ x 11 inches. Price: members, gratis; nonmembers, $1.00 postpaid.

This standard was prepared to bring about greater uniformity in the field of instrumentation. Tables give recommended symbols for the following thermocouple combinations and extension wire: Iron—Constantan (Types J and Y); Chromel—Alumel; Platinum—10 per cent Rhodium-Platinum; Platinum—13 per cent Rhodium-Platinum; Copper—Constantan.

Spectral-Transmissive Properties and Use of Eye-Protective Glasses. Published by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 34 pages. 93 figures. Price, 20 cents per copy.

This publication is the result of a study of the spectral-transmissive properties of approximately 200 glasses intended for use either as sun glasses or in special industrial operations where injurious amounts of radiant energy are present. Extensive consideration is given to elimination of glare, color distortion, use of glasses for night driving, standardization of glasses for outdoor and industrial purposes, and the special transmissive properties of glasses for use under various types and intensities of ultraviolet, luminous, and infra-red radiation.

Catalogs

FOR YOUR LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Instruments
"Specification Index for Bristol Instruments" is the title of a bulletin published by The Bristol Co., Waterbury 91, Conn. Designated as No. W1800, the bulletin contains illustrated data on the Bristol line of automatic controlling, recording, and indicating instruments.

2. Non-Ferrous Alloys
The Seymour Manufacturing Co., Seymour, Conn., has issued catalogs describing specifications, properties, and characteristics of Seymour Nickel Silver Alloys and Phosphor Bronze Alloys.

3. Black Finishes
A "Black Book" describing details of Zinc Black and other Black-Magic metal finishes has been published by the Mitchell-Bradford Chemical Co., Stratford, Bridgeport, Connecticut.

4. Electrostatic Spray Painting
A booklet entitled "Ransburg Coating Processes" describing electrostatic spray painting has been issued by Harper J. Ransburg Co., Indianapolis 7, Indiana.

5. Emulsion Cleaner
Mul Emulsion Cleaner is described in a folder issued by The DuBois Co., Cincinnati 3, Ohio, in which properties and suggested uses of the product are outlined.

6. Backstand Belts
"Facts About Backstand-Belt Grinding and Polishing" are enumerated in a booklet being distributed by Armour & Co., Chicago 9, Illinois.

7. Aluminum Finishes
A 64-page manual entitled "Finishes for Alcoa Aluminum" is available from the Aluminum Company of America, Pittsburgh 19, Pennsylvania.

8. Centrifugal Dryer
The New Holland Machine Co., New Holland, Pa., has published a bulletin providing complete specifications of the New Holland Kreider Centrifugal Dryer and describing typical installations.

9. Infra-Red Brochure
The Fostoria Pressed Steel Corp., Fostoria, Ohio, has published Brochure EV-1146 which illustrates and describes the use of the Fostoria Evenray System in industrial heating applications.

10. Industrial Wire Cloth and Screens
K-P Catalog No. 36, issued by Korb-Pettit Wire Fabrics and Iron Works, Inc., Philadelphia 22, Pa., describes by means of illustrations and data tables the many types of industrial wire cloth and woven wire screens manufactured by the company.

11. Gold Plating
An instruction booklet describing gold coloring solutions for various shades of gold is now being issued by Baker & Co., Inc., Newark, New Jersey.

12. Duranite H Folder
A folder outlining field results and laboratory tests made on its new organic finish, Duranite H, and extending over a two-year period is available from the Industrial Finishes Dept., Atlas Powder Co., Wilmington 99, Delaware.

13. General Purpose Fans
"General Purpose Fans" is the title of an eight-page bulletin designated as Bulletin 481 distributed by the New York Blower Co., Chicago 16, Illinois.

14. Flock Color Card
A color card containing samples of flock finishes has been issued by the Rayon Processing Company of Rhode Island, Inc., Central Falls, Rhode Island.

15. Plating Equipment
Bulletins describing equipment for various plating, polishing, anodizing, descaling, oxidizing, and deburring operations are available from Munning & Munning, Inc., Newark, New Jersey.

16. Chemifinishes
General information concerning the finishing of metals with Du-Lite materials is contained in literature prepared by The Du-Lite Chemical Corp., Middletown, Connecticut.

17. Electric Radiant Heaters
The Edwin L. Wiegand Co., Pittsburgh 8, Pa., has available Bulletin CS-603 which describes the construction of Chromalox heaters and lists the uses, operating characteristics, and advantages of the infra-red units.

18. Temperature Controls
Self-operated temperature controls for plating and finishing applications are described in Catalog No. 650 available from the Sarco Co., Inc., New York 1, New York.

19. Deburring and Finishing Equipment
"Cut Labor Costs ½ or More" is the title of a bulletin issued by Almco, Division of Queen Stove Works, Inc., Albert Lea, Minn., describing the complete line of Supersheen deburring and finishing barrels, equipment, and supplies.

20. Striplastic No. 320
A bulletin describing the properties and applications of Striplastic No. 320 is available from the Striplastic Co., Cleveland 6, Ohio.

21. Cleaning Emulsion
"Minit-Kote," a cleaning emulsion for preparing metal surfaces for painting, is fully described in a four-page two-color illustrated folder prepared by Klem Chemicals, Inc., Dearborn, Michigan.

22. Descaling Process
The Bullard-Dunn Process of electrochemical descaling of ferrous metals is described in detail in a bulletin available from the Bullard-Dunn Process Division, The Bullard Co., Bridgeport 2, Conn.

23. Finishing Equipment
The Despatch Oven Co., Minneapolis 14, Minn., has prepared Bulletin C-51 which illustrates and describes its complete line of gas-oil, electric, and steam finishing equipment.

24. Zinc and Cadmium Dip
"Iridite," a quick dip process for improving corrosion resistance or as a paint base or final finish on all zinc or cadmium surfaces, is described in a four-page folder published by Allied Research Products, Inc., Baltimore 5, Maryland.

25. Demineralizers
Filt-R-Stil Demineralizers designed to deliver the low cost chemical equivalent of distilled water are illustrated and described in a booklet issued by the Ion Exchange Products Dept., American Cyanamid Co., New York 20, New York.

26. Plating Barrel
Facts concerning the construction and operation of the new King Hardwood Plating Barrel are presented in a folder available from King's Hardwood Plating Barrels, Dayton 3, Ohio.

27. Abrasive Grain
The Simonds Abrasive Co., Philadelphia 37, Pa., is issuing an illustrated data sheet on "Borolon" Aluminum Oxide Abrasive Grain for the polishing trade and general industrial uses.

28. Activated Carbon
The use of activated carbon for decolorizing, purifying, and deodorizing various liquids and electroplating solutions is described in literature available from the Darco Corp., New York 17, New York.

29. Spray Equipment
Catalog 86, illustrating and describing its line of low pressure spray guns, automatic spray guns, nozzles and tips, spray gun accessories, pressure tanks and control heads, portable painting units, stationary compressors, and Pneumix air-motored agitators, is available from the Eclipse Air Brush Co., Newark 7, New Jersey.

PRODUCTS FINISHING
431 Main St., Cincinnati 2, Ohio

I am interested in receiving the following literature reviewed in your May issue.

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City ..... State.....

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